Asian Markets for Alaska Logs and Lumber

Japan

Overview of the Japanese Housing Market

The greatest single end use for imported wood in Japan is the housing industry (JAWIC undated). In 1992, it was determined that 79% of lumber shipments went into housing construction (Gaston 1997). Japan's residential housing market has consistently been one of the largest and most dynamic in the world. Since 1987, Japan's housing starts have been approximately equal to those in the United States even though Japan has only 46.9% of the population and 3.9% of the land mass of the US (Table 4). Another way of viewing Japan is to place half the US population into an area the size of California. Obviously, population densities are very high in Japan and the high population densities have an impact on the type of housing built, especially in the cities.

In 1997, housing starts in the US and Japan totaled 1.5 million and 1.4 million units respectively (Figure 12). The US and Japanese housing starts follow world economic trends and exhibit differences based on domestic trends as well. Both countries experienced rapid economic growth in the early 1970s as indicated by the high level of housing starts until 1973 when the OPEC oil crisis contributed to a decline in the number of new housing starts in both countries. Both countries also experienced housing slumps in the early 1980s and 1991 during the recession and the Persian Gulf War, respectively.

In Japan, housing starts were very high during the late 1980s and 1996. 1996 was the first time since 1987 during the Bubble Economy when housing starts increased by double-digit increases over the previous year (Figure 12). The high volume of housing starts in 1996 were caused in part by the rebuilding activity following the Hanshin Earthquake in Kobe, which occurred in 1995. The earthquake damaged 147,600 houses (Japan Lumber Reports 1995) and displaced 400,000 households (Pacific Rim Wood Market Report 1996). In 1996, housing starts were also high because homeowners rushed to purchase houses before the Ministry of Finance increased the national consumption tax from 3 to 5% on April 1, 1997. The consumption tax applied is to housing, and consumers wanted to avoid paying hundreds of thousands of yen in extra taxes.

The dramatic decrease in housing starts in 1997 can be attributed to four factors: an increase in the consumption tax from 3% to 5%; an increase in the cost of living due to the removal of income tax reduction, an increase in the cost of medical care, which was expected to total 9 trillion yen; and a lack of funds for large public works by the government due to the anxiety over the troubled banking system; and an overall slump in the economy (Japan Lumber Reports 1998a). The government's implementation of various fiscal policies were expected to knock a full point off private spending in 1997 (Bremner and Takahashi 1996). Late 1997 was also the time of currency devaluations and economic instability throughout Asia.

A combination of factors in Japan have historically supported high levels of housing starts including: active construction of rental housing, low mortgage interest rates, active government support for providing inexpensive housing, sustained growth of per capita income, population growth, rapid turnover of existing housing stock, large migration to urban centers, large volumes of existing low quality housing in need of overhaul, improved tax benefits for housing, and stable land prices (JETRO 1995; Robertson and Waggener 1995). For example, since 1950 the population in Japan has increased by 50% while household size has fallen from 5.02 to 3.01, suggesting a trend from the traditional extended family to a smaller nuclear family (Robertson and Waggener 1995). The increase in population and the number of nuclear family households have increased the demand for housing.

Table 4. Comparison of key demographic factors between Japan and US.

	Japan	US
Total area (sq. km)	377,835	9,629,091
Population (1997 estimate)	125,732,794	267,954,764
Housing starts (1999)	1,214,601	1,667,000

Source: Japan Lumber Journal 1998a; and Stat-USA 1998

Currently, Japanese houses are typically replaced every 20-25 years and most new housing starts are on building sites on which homes have been demolished (Eastin 1994; Jahraus and Cohen 1997). Given the poor quality of most post-war housing, it is more cost-effective and efficient to demolish these older homes rather than repair or remodel them (Eastin 1994).

Although there are many ways to classify residential housing in Japan, all houses must meet the requirements of the Building Standards Act (JETRO 1993). These building codes cover all aspects of the construction industry in Japan. The BSA ensures that the building site and structure are constructed in a manner that does not endanger the occupant's life, health, and property from preventable disasters. All housing must also meet the strict fire prevention and flammability guidelines of the Fire Laws. Fire prevention requirements are strict because of a past history of devastating fires in Japan's residential areas. Major fires burned down many houses during the Great Kanto Earthquake in 1923, which was centered in Tokyo, and the 1995 Hanshin Earthquake in Kobe. Fires in urban areas have historically caused many fatalities and, in response, the Japanese government implemented strict guidelines regarding the construction of fire-resistant houses to prevent the spread of fire to adjacent buildings. In addition, residential lots are small in size in urban areas and the footprint of the house covers most of the lot, resulting in houses being very close together, a factor that contributes to the necessity of fire resistant housing.

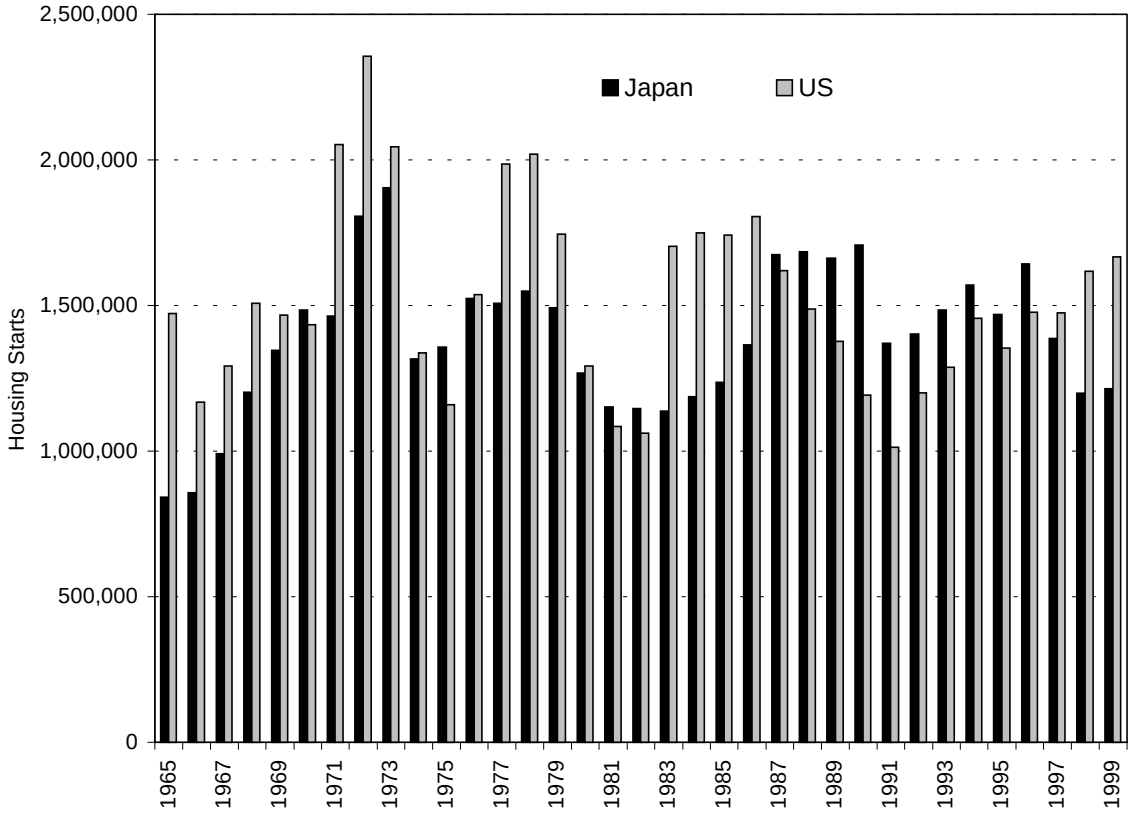

Figure 12. Comparison of US and Japan housing starts, 1965-1999.

Residential Housing Types

One way that residential housing can be classified is by occupancy type: single-family detached versus multiple-family collective housing residences (including apartments and Nagoya style townhouses) (JETRO 1996a). In 1999 multiple-family residences made up the majority of total housing starts at 50.7%, down from 53.6% of the total in 1998. Despite this drop, there is a clear trend towards building multiple-family residences to house the dense population, particularly in the large urban areas. In Tokyo for example, 65.3% of all residences are multiple-family units. Throughout all of Japan however, multi-family units comprise only 41.8% of the stock of housing.

JETRO (1996a) and the Japan Lumber Journal (1998a) also divides total housing starts based on whether the houses are constructed from wood or non-wood materials, such as concrete and steel (Figure 13). There are two main types of wooden housing built in Japan: traditional Japanese post-and-beam houses and North American style 2x4 houses. The 2x4 housing industry has experienced healthy growth within the wooden house segment.

Wood has always been an important part of Japanese culture and trees were thought to be the places where the native gods first descended to earth. As a result, wood has traditionally had strong religious meaning and most temples and shrines are constructed with wood framing. The Japanese people are deeply drawn to the aesthetic beauty, strength, and aroma of wood. Wood's attractiveness is also demonstrated by how Japanese consumers place a high value on wood in their homes. A survey conducted by the Japanese Prime Minister's Office showed that, if given a choice, nearly 80% of respondents would prefer to live in a wooden house (Coaldrake 1990).

Residential housing was dominated by wooden housing well into the mid-1970s, accounting for almost two-thirds of all housing in 1976. However, the continued growth in multi-family housing and prefabricated single family housing has contributed to the declining share of wooden housing and in 1999 wooden housing represented just 46.6% of all housing starts in Japan.

The type of financing used for new houses is another way in which government and industry associations have segmented the residential housing industry (Japan Lumber Journal 1998a; Pesonen 1993). The two sources of financing are private and public (Figure 14). The majority of all house financing in Japan is through private sources at 55.7% in 1999. The remaining mortgage financing is through public mortgage lenders, in particular the Government Home Loan Corporation (GHLC) which provided 37.5% of all mortgage funding in 1999. The GHLC was established by the government in 1950 in order to provide middle-class homebuyers with low interest loans (JETRO 1995). The interest rate for GHLC mortgage loans is well below market interest rates and in April, 2000, the GHLC interest rate was 2.85% (Japan Lumber Journal 2000). The GHLC has strict rules regarding eligibility criteria for potential borrowers and house size. In 1993, the income ceiling was raised to ¥13.225 million to allow a larger proportion of the population to qualify for the mortgage loans. Financing was also expanded to houses up to 2,580 ft^2 floorspace from 2,370 ft^2. This resulted in a record 667,118 mortgages being granted by GHLC in 1994, whereas in 1999 GHLC loans totaled 454,984 houses.

Residential Housing Industry Structure

Housing is mainly constructed through two methods: subdivision sales and owner constructed housing (JETRO 1996a). Subdivision sales are like sales in the US where a developer sells both the new house and land in a new residential development. These developments are sometimes referred to as *new towns*. The companies involved in large subdivision developments do most of the development. They redevelop land tracts, sell the houses, and usually design and construct the house. Other companies acquire small tracts of land to develop and sell houses. These are the *tateuri* (build and sell) or *mansion* (condominium) companies. Incidentally, in Japan, the term *mansion* is commonly used to refer to high rise apartments or condominiums, even though they usually have a smaller floor area than detached single-family houses.

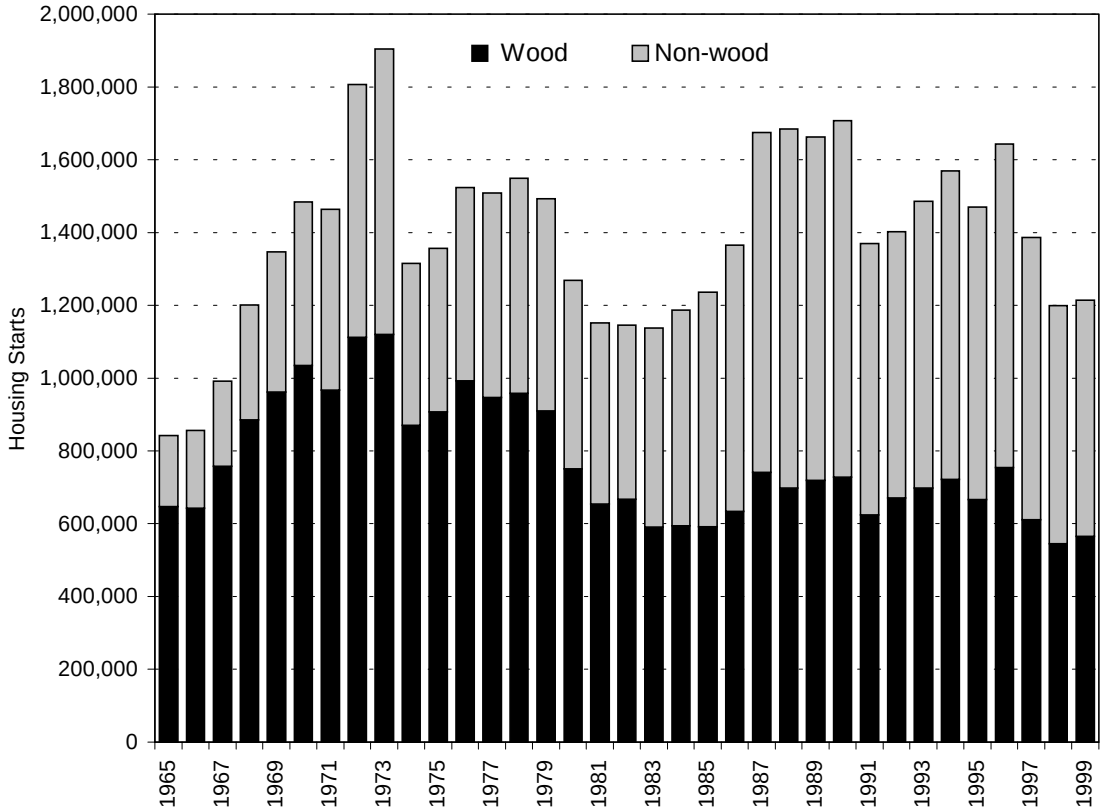

Figure 13. Japanese housing starts since 1965 based on structural material used
(Source: derived from data provided in Japan Lumber Journal).

Owner constructed housing consists of construction of a new house for personal dwelling. In many cases, the landowner tears down an older house and builds a new house in its place. These types of houses are mostly custom built to fit the shape and size of the lot (McKellar 1995). The owner has very strict specifications for their new house and their input is constantly solicited throughout the design and construction process. As suggested by Leonard Guss Associates, Inc. (1992), homes with a unique appearance are desired and "cookie-cutter" houses do not do well in this market segment.

JETRO (1996a) describes the three main groups of Japanese single-family house builders as: 1) large, national housing manufacturers, 2) medium-sized, regional housing companies, and 3) small, local homebuilders (*kohmuten*) and/or carpenters. The large housing manufacturers have powerful nation-wide sales networks. In fiscal 1999, there were eight large housing manufacturers who each had annual sales of approximately 10,000 units or more. The eight largest homebuilders in Japan include: Sekisui House (63,300 homes built in 1999), Daiwa House (38,000), Misawa Homes (34,000), Sekisui Chemical (24,180), National House Industries (18,300), Asahi Chemical Industries (15,800), Sumitomo Forestry (10,550), and Mitsui Home (9,600). These firms often supply building materials manufactured in their own factories even though the actual construction is subcontracted out to smaller companies. The regional housing companies are based in the local communities and they provide design, sales, and construction services. The medium-sized companies typically build approximately 50 houses annually. These companies see high potential growth because they construct most of the 2x4 houses whose sales are expected to grow rapidly (Pacific Rim Wood Market Report 1996). On many occasions, the actual construction is subcontracted to smaller companies.

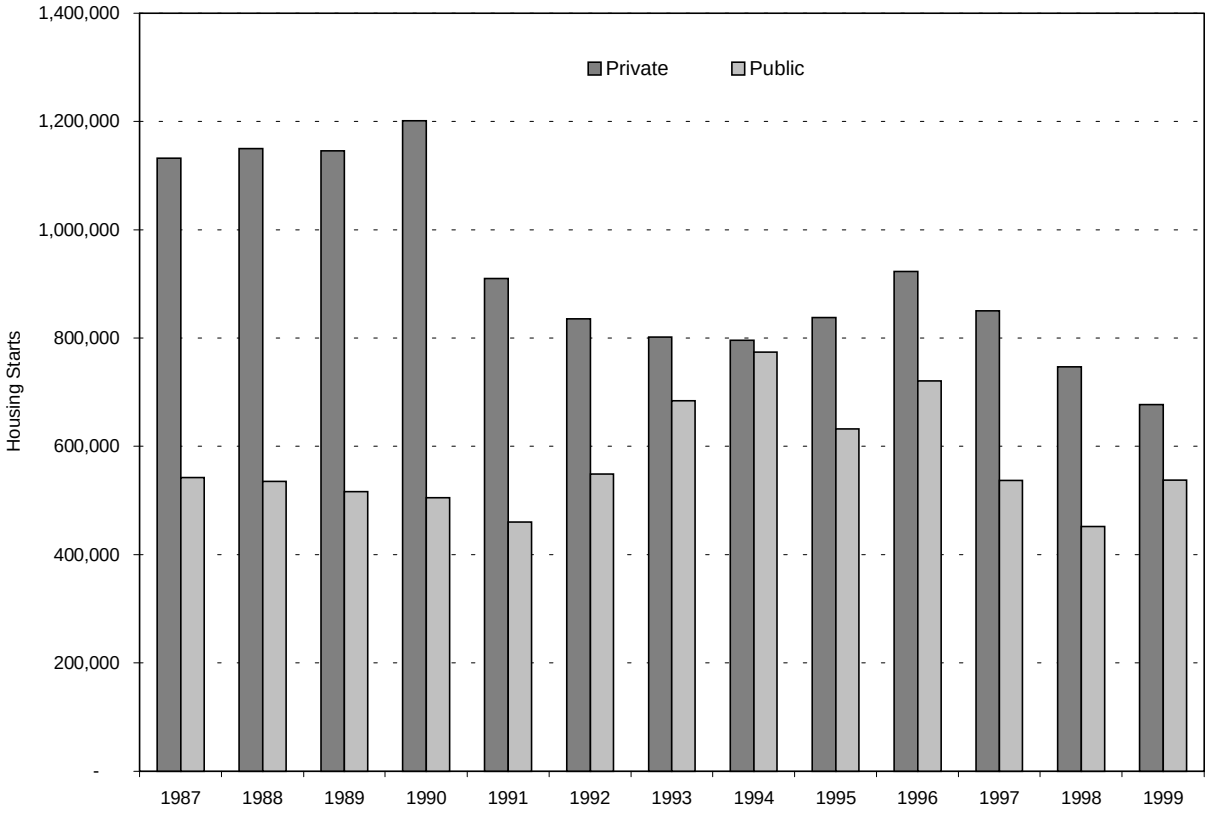

Figure 14. Number of total housing starts, by source of mortgage funding
(Source: JETRO 1993; Japan Lumber Journal 1998a).

The smallest housing companies do most of the actual construction of houses for both themselves and for the larger companies. The small companies include self-employed carpenters who work as labor subcontractors. The small companies build roughly three to five houses annually. Historically, small companies have controlled the largest market share within the housing industry. The Japan 2x4 Homebuilders Association describes how most of the North American 2x4 houses are constructed by small and medium sized companies (Roos and Eastin 1998). The large companies primarily construct Japanese-style 2x4 houses (based on a 3x6 module). The large national companies have seen their market share increase to roughly 20 to 30% of the single-family housing market, partly because they also construct steel and concrete multiple-family units whose market share has been growing.

Pesonen (1993) describes five main types of house builders and building contractors: large building contractors, local builders and carpenters, post-and-beam precutters, prefabricated housing companies, and platform-frame construction companies. The large building contractors consist of 6-8 major contractors who account for 15% of total residential construction. These companies deal primarily with concrete and steel-based multi-family residences. The local builders and carpenters include approximately 50,000 small companies who account for about 60% of total residential construction. These companies are primarily involved in the construction of wooden post-and-beam houses. The post-and-beam precutters are comprised of about 240 companies. These companies have "industrialized" the production of building components and construct about 60,000 units annually. The prefabricated housing industry is capital-intensive and oligopolistic. The 10 largest companies produce over 90% of the total units built. The platform-frame or 2x4 construction companies are comprised of 750 companies with the five largest accounting for over 50% of total 2x4 housing units.

A survey by the Management and Coordination agency found there were 92,500 companies directly involved in

wooden house construction in Japan (JETRO 1996a). In addition, there were about 62,000 firms operating mainly as carpentry subcontractors. The average number of employees per housing company was 5.1, while it was 2.9 per carpentry business. These figures illustrate the fact that the majority of companies in the residential construction industry are small operations.

When a large housing company gets an order to build a house, it typically will subcontract the work to a construction company that in turn, subcontracts work to companies that specialize in various jobs such as foundation, framing, roofing and electrical work. After this level of subcontractors, there is usually another layer of subcontractors that do the construction. Levy (1990) has suggested there are potentially seven layers of subcontractors between the consumer and the actual workers who construct the house. This complex system is referred to as the "multi-layered" or "multi-tiered" subcontracting structure (JETRO 1996a). This system makes building a house in Japan more complex and expensive than in the US. In addition, constructing a house in Japan is also different than in the US because it is a common practice to include labor costs when invoicing material costs. This practice is called the *total material and labor* system (JETRO 1996a). This system makes it difficult to calculate the construction cost of a house.

Changing Nature of the Residential Housing Market

Historically, post-and-beam housing had dominated the residential housing market. In 1963, 86.2% of all residential housing starts utilized the traditional post-and-beam construction method (Coaldrake 1990). However, in 1996, they represented only 39.3% of all new residential housing starts (JETRO 1996a). Great inroads have been made mostly by the steel and ferro-concrete construction industry. Since 1968, the share of multiple-family housing units have increased 16.6%. Multiple-family housing units are characterized by high-rise, high-density condominium or "mansion" buildings where steel and concrete are used for structural integrity as specified in the building codes. In large cities such as Tokyo and Osaka, they are an absolute requirement to house the enormous population. Japan is already one of the most densely populated countries in the world at 857.1 people per square mile. However, the population density increases to 2,571.3 people per square mile because only 33% of Japan is habitable. The other 67% is made up of mountainous and uninhabitable terrain. In addition, for many people, mansions are more affordable than a detached single-family house (WWPA 1994). The only drawback to mansions is that their floor space is usually smaller than the average single family residence. On average, the floor space for a single-family residence is 2.7 times greater than for a multiple-family residence (JETRO 1996a).

Inroads by prefabricated houses and 2x4 houses have further taken market share away from post-and-beam houses. Prefabricated units constructed of all materials comprised about 8.7% of residential housing starts in 1999 (Japan Lumber Journal 1998a). In addition, 2x4 units comprised about 6.2% of residential housing starts in 1999. Post-and-beam housing construction has also decreased because of an aging labor force. Many young people dislike entering the construction workforce because of the harsh and dirty work involved. The construction industry is not viewed as a favorable place to work because of a poor industry safety record in past years. It also takes seven years of apprenticeship training to become a post-and-beam carpenter-another factor which discourages entrance into this profession (Cohen *et al.* 1996). As a result, the average age of a carpenter is almost 53 years old and it is estimated that the number of construction workers will decrease by 45% by the year 2000 (Pesonen 1993).

Japan has traditionally been a culture that shuns outside ideas and people. Consumers in Japan, however, are increasingly preferring the look of western style houses (JETRO, 1996a). This is especially true with the younger generation. A greater proportion of the population has lived or traveled overseas. The strong yen and the bubble economy of the 1980s and early 1990s allowed many Japanese to travel overseas and experience other cultures and lifestyles. In addition, there are significant numbers of Japanese who have lived overseas as a result of business transfers within a multinational corporation, overseas study, and homestays. These Japanese have seen the quality of housing in other cultures and are now demanding this same high quality for their own houses in Japan.

Most Japanese are very dissatisfied with their houses. A 1993 MOC survey showed that 49.4% of households are not satisfied with the condition or quality of their housing condition. Among the more commonly cited reasons are an inadequacy of space, inferior layout of rooms and facilities, poor noise and inadequate thermal insulation, and general wear and tear of their houses (JETRO, 1996a). There is great interest in matching the quality of their housing with their wealth and consumer spending power.

The Impact of the Economic Recession and Changes in the Japanese Housing Construction Laws and Regulations

Despite the gradual decline in wooden housing, the Japanese market represents a tremendous opportunity for US wooden building materials. Not only have exports of primary wood products experienced strong growth due to Japanese demand, but the Japanese demand has extended into secondary wood products as well. While not approaching the level of primary wood products, secondary wood product exports to Japan experienced phenomenal growth over the period 1989-1996, increasing by 245% to reach a level of $388 million.

However, since 1997 the economic recession in Japan has had a devastating impact on the Japanese housing industry, sending thousands of contractors out of business and reducing housing starts from 1.66 million units in 1996 to just 1.21 million units in 1999 (and the outlook for 2000 is approximately 1.25 million units). Not surprisingly, the decline in housing starts has had an adverse effect on US wood product exports to Japan, with exports of primary wood products declining by 52% and secondary wood products declining by 44% from 1996 to 1998. Similarly, Alaska primary and secondary wood product exports to Japan declined by 65%.

Compounding the impact of the economic recession and the decline in housing starts has been the surprising strength of the yen and the relative weakness of the Canadian dollar and the Euro. The impact of these currency changes has been to reduce the competitiveness of US wood products at a time when Japanese homebuilders are looking to increase their imports of wooden building materials. As a result, European exports of softwood lumber to Japan have increased dramatically, largely at the expense of US hemlock exports. Since 1989, the US market share for softwood lumber has declined from 48.3% to 10.7%, while the European market share has increased from 0% to 16.4% and the Canadian market share has increased from 50.9% to 59% (Figure 2).

As US manufacturers and exporters of wood products struggle to adjust to changes in the competitive environment in Japan, they are now being confronted with two regulatory changes that directly affect the Japanese residential construction industry. The revised Building Standard Law of Japan and the Housing Quality Assurance Law will significantly impact the structure of the residential construction industry in Japan, the mix of products that builders will use, and the range of services that they will require from suppliers in the future. In the following paragraphs, we will describe these regulatory changes and endeavor to explain their implications and the impact that they might have on the competitiveness of US manufacturers and exporters of wooden building materials.

Regulatory Changes in Japan

In May, 1998 the Building Standard Law of Japan (BSL) received its first major revision since 1950. The major actions of the BSL now: (1) specify interim and final building inspections and (2) transform the BSL from a specification-based building code to a performance-based building code. The first revision of the BSL requires that all residential housing units receive an interim and final inspection. Further, completion of the interim inspection is required before a building is eligible to receive its final inspection. Since there are only approximately 1,800 building inspectors in Japan, the BSL revisions will enable private construction inspection firms to be established. To provide guidance to the private inspection firms, a qualification system and standards has been established within the revised BSL. In the future, contractors will be allowed to obtain a construction inspection from either a private construction inspector or an inspector from the local government agency. Although the BSL revisions went into effect in May, 1999, given the shortage of inspectors in Japan, and the fact that many municipalities have not yet adopted the new inspection procedures, it is anticipated that the full implementation of this revision will take some time before it is fully phased in.

The second revision transformed the BSL from a specification-based standard to a performance-based standard. In the future, it is expected that any material that meets the performance standards can be used in residential construction. However, there is no mention about whether there will be reciprocity on test standards. Reciprocity would allow US firms to use the results of product tests conducted in the US in order to meet the performance standards in Japan to gain acceptance of their products. In addition, it is unclear how this change in the BSL will impact firms that have already gained code approval for their products under the previous version of the BSL.

In addition to revising the BSL, the Housing Quality Assurance Law (HQAL) was also promulgated to provide homebuyers with specific safeguards in resolving disputes with building contractors. The four objectives of the HQAL are to: (1) improve the quality and performance of residential homes, (2) provide homebuyers with a mechanism for resolving disputes with building contractors, (3) establish a set of "Housing Performance Indication Standards" against which specific houses can be compared, and (4) establish a housing completion guarantee system. The HQAL, which went into effect in April, 2000, will significantly change the nature and structure of the

residential construction industry in Japan, including the specification and use of domestic and imported wooden building materials. A more detailed assessment of the individual components of the HQAL is presented below.

The first objective of the HQAL is aimed at improving the quality and performance of new homes by requiring homebuilders to provide homebuyers with a ten year warranty against structural defects and low durability (e.g., water infiltration into the structure). Under the guidelines of the HQAL, homebuyers may make claims against homebuilders if the structural performance or durability of a home is judged to be sub-standard relative to a specific set of judgement criteria (which have yet to be published). These judgement criteria, which are expected to be published soon as a set of "Judgement Standards for Defects," will be prescriptive in nature and likely very detailed. For example, it is expected that a floor found to have a slope exceeding 6/1000 would require the contractor to take action to level the floor.

Since 1982 the Organization for Housing Warranty (affiliated with the Ministry of Construction) has provided ten year warranties for registered builders. Builders wishing to become registered with OHW simply pay a modest registration fee. As members of OHW, builders are required to cover all warranty costs during the first two years of the warranty period. However, during the remaining eight years of the warranty the builder is responsible for only a set amount of a warranty claim, with the remaining amount being covered by OHW. In the future it has been speculated that the two year exemption period may be removed given the fact that OHW has only paid out approximately ¥50 million while taking in registration fees in excess of ¥12 billion. With the ten year housing warranty guarantee now being mandatory, it will be interesting to see if OHW continues to provide registrations to all builders, regardless of size, financial stability, or qualifications.

There are a number of implications associated with this first component of the HQAL that are important to US manufacturers and exporters of wooden building materials. First, many small homebuilders will not be able to provide the requisite ten year warranty and they will be forced to either go out of business or become subcontractors for larger more financially stable firms. Second, most builders will look to use higher quality materials in their homes. This trend is already reflected in the fact that the use of dimensionally stable kiln-dried lumber in home construction has increased dramatically as has the volume of dry kiln capacity in Japan. Similarly, the use of glulam posts and beams has increased significantly and provided a tremendous market opportunity for European lamstock. Finally, homebuilders will look to the manufacturers and exporters of wooden building materials to provide extended warranty coverage for their products and in essence try to push the warranty responsibility back down the distribution channel back to the export consolidators and manufacturers.

The second objective of the HQAL is to establish a mechanism for resolving disputes between homebuyers and builders. To accomplish this objective, the HQAL mandates the establishment of Alternative Dispute Resolution (ADR) bodies in each prefecture in Japan. Each ADR will be staffed by a lawyer who will work to reconcile disagreements between builders and their customers during the ten year warranty period. Using the "Judgement Standards for Defects" as a guide, the lawyer will judge the severity of the defect against the standard to determine if a defect exceeds the allowable guidelines. If a defect is judged to be in excess of the allowable standard, then the builder will be required to correct the defect or compensate the homeowner.

The third objective of the HQAL is to establish a voluntary set of "Housing Performance Indication Standards" against which the performance of individual houses can be compared. The specific types of performance characteristics contained in this provision of the HQAL include: (1) structural performance, (2) fire safety, (3) durability, (4) ease of maintenance and management, (5) energy efficiency, (6) air quality, (7) ratio of exterior openings to total wall area, (8) noise transmission, and (9) barrier free design. The performance of a individual houses will be judged by a "Designated Evaluation Body" using the criteria established in the "Japanese Housing Performance Indication Standards". These evaluation bodies will be responsible for not only approving the architectural design of the house but they will also perform inspections of the home during the construction process including the foundation process, structural framing process, and interior finishing phases of the project. Houses that are judged to meet or exceed the performance indication standards will receive certification as a "Performance Recognized House", thus providing the builder with a way to differentiate their home from those of their competitors.

In addition, this section of the HQAL also makes provision for manufacturers of building components that meet the performance standards to become certified as "Authorized Manufacturers of Performance Components" thus providing them with some advantage in supplying their products to builders. While the performance indication system is voluntary, it is expected that once the Performance Indication Standards have been published, prospective homebuyers will begin to insist that builders show how their homes compare to the performance standards and in

this way it may become an informal requirement of the marketplace. To the extent that domestic manufacturers have an advantage over foreign manufacturers in gaining recognition as "Authorized Manufacturers of Performance Components", this system has the potential to exclude foreign manufacturers and their products from a growing segment of the market.

Finally, the HQAL includes a provision for a Completion Guarantee System to protect homebuyers against default by, or the bankruptcy of, their contractor prior to the completion of the home. This provision of the HQAL was made necessary for two reasons. It is typical in Japan for the homebuyer to provide up front financing to the contractor during the construction process. For example, it is not unusual for the homebuyer to pay the contractor one-third of the price of the home before construction begins, with an additional third due after the house has been framed in and the remaining funds due upon completion of the house. This system may have worked well in the past but, given the current economic recession in Japan, a large number of contractors have recently gone bankrupt, leaving homebuyers with partially completed homes and outstanding payments due on building materials. The aim of the Completion Guarantee System is to provide homebuyers with a form of insurance so that, in the event their builder goes bankrupt, funds will be available to complete the construction of their house.

To date, two organizations have been established to provide completion assurance guarantees. The first organization, Jutaku Anshin Assurance Company, is a privately funded effort between 52 national building material retailers (each of whom contributed ¥5 million) with substantial support from a consortium of four major Japanese insurance companies. The second organization, known as the Organization for Housing Warranty, is a publicly funded organization that will also provide completion guarantees to homebuyers.

In order for a homebuilder to become a member of either of these organizations, they must submit a financial statement of their company for examination. Builders that are judged to be financially unstable will be unable to join either organization and therefore will be unable to provide their customers with a completion guarantee. It is estimated that there are approximately 160,000 contractors in Japan and less than 50,000 of them build more than ten homes per year while the remaining contractors tend to be very small firms who build just 1 or 2 homes per year. Given this industry structure, it is widely expected that many of these small firms will not have the financial resources to join one of the Completion Assurance systems. Obviously this will place these builders in an extremely weak position when they try to establish contracts with new customers. In fact, there is strong speculation that any new home construction being financed with a GHLC mortgage will be required to have a completion assurance guarantee issued prior to signing the construction contract.

This system of providing homebuyers with completion assurance guarantees, particularly the privately funded Jutaku Anshin Assurance Company, has significant implications for manufacturers and exporters of wooden building materials. It can be expected that Jutaku Anshin will focus on recruiting the larger, more financially stable, builders into their program. To the extent that this relationship encourages member builders to purchase their products through member building material retailers, while discouraging relationships with non-member retailers or direct purchases from US manufacturers and consolidators, it will effectively restrict market access for US firms. The direct relationship between Japanese builders and US manufacturers and consolidators, which in the past had become an increasingly important distribution channel, could be phased out in favor of keiretsu-like relationships within the assurance group.

In summary, several factors have contributed to a substantial restructuring of the building code and regulations that affect the residential construction industry in Japan. The primary objective of the changes has been to increase the quality, performance, and durability of residential homes while providing homebuyers with increased protection. However, a number of these changes have the potential to reduce the competitiveness of imported wooden building materials in Japan and severely restrict the ability of US manufacturers and exporters to sell directly to Japanese homebuilders. In addition, there is a strong liklihood that Japanese homebuilders (and wholesalers) will work to require that US manufacturers and/or exporters of wooden building materials provide extended warranties for their products that extend over the ten year warranty period. All of these factors are matters of concern for US manufacturers and exporters of wooden building materials who could see their position in the Japanese market undermined by the new building code revisions and regulations.

Alaska Wood Product Exports to Japan

Japan is Alaska's most important export market. Not only has Japan consistently comprised approximately two-thirds of Alaska's revenue from wood product exports, but Japan also purchases almost all of Alaska's old growth Sitka spruce logs and cants. In terms of sales revenue, the second leading export destination is Canada, followed by South Korea. Like other PNW timber suppliers, Alaska has been heavily impacted by the Asian recession. Although export revenue from sales to Japan had been declining steadily since 1989, the impact of the decline in the housing market in Japan, which started during the fourth quarter of 1996, has had the most significant impact on revenues. Between 1996 and 1998, export revenue from Japan declined 65%, the greatest decline in Alaska's exporting history (Table 4). Alaska wood products performed similarly in the other Asian markets and forest products exports to South Korea declined 62%, while exports to mainland China declined 83%.

Almost 95% of Alaska's wood products export revenue is generated by softwood logs, lumber, and chips (Figure 15). Over 70% of Alaska's wood products are exported in the log form, with over 51% of log sales shipped to Japan. Other leading markets for Alaska logs includes Canada, Korea, and China (Table 5). It should be noted that these export numbers may include limited volumes of pass through products, which are products that pass through Alaska ports en-route to international markets. Softwood log export volumes declined significantly between 1989 and 1998, largely due to declines in Japan, Korea, and China. Export revenues remained somewhat more stable as softwood log prices increased following supply constraints in the PNW, only to fall as a result of the Asian economic crisis.

While South Korea and China have been major consumers of Alaska logs, these markets are much more price sensitive than Japan. They also have different uses for imported logs, and prefer lower quality and lower priced timber. To a large extent, South Korea and China have substituted lower cost radiata pine for hemlock and Douglas-fir as log prices in the US have increased.

Table 5. Alaska's total solid wood product exports by destination (US $ millions).

Destination	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Change 1996-'98
Japan	$436.4	$433.4	$374.7	$371.6	$482.9	$409.5	$375.9	$355.5	$301.8	$126.2	-65%
Canada	$9.5	$3.7	$9.1	$3.7	$1.9	$8.2	$36.3	$17.6	$26.6	$26.6	51%
South Korea	$44.2	$53.3	$37.8	$49.6	$77.5	$53.0	$58.2	$65.5	$72.0	$24.7	-62%
Hong Kong	$0.2	$0.5	$1.0	$6.1	$1.9	$1.9	$2.6	$3.9	$4.7	$5.9	51%
China	$25.4	$23.0	$30.0	$32.0	$22.3	$26.8	$18.0	$14.9	$9.4	$2.5	-83%
Other	$1.2	$1.2	$1.2	$1.2	$1.1	$1.2	$1.2	$1.2	$1.1	$1.0	-59%
Total	**$623.4**	**$620.5**	**$544.3**	**$574.4**	**$662.8**	**$579.7**	**$603.8**	**$528.7**	**$448.3**	**$192.7**	**-64%**

Source: U.S. Department of Commerce 1999

Table 6. Alaska's softwood log export volume by destination (1,000 cubic meters).

Destination	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Japan	2,216	1,990	1,653	1,605	1,718	1,795	1,617	1,735	1,592	731
South Korea	2,903	2,204	2,019	1,354	755	500	570	336	271	51
China	2,096	1,539	1,456	915	433	274	63	54	64	55
Canada	137	128	132	31	13	38	607	181	50	68
Hong Kong	0	0	0	20	0	0	0	0	0	0
Other	9,020	7,767	6,257	5,958	4,817	4,514	4,413	4,502	2,744	2,953
Total	**16,372**	**13,628**	**11,517**	**9,883**	**7,736**	**7,121**	**7,270**	**6,808**	**4,721**	**3,858**

Source: U.S. Department of Commerce 1999
1 cubic meter equals 423 board feet

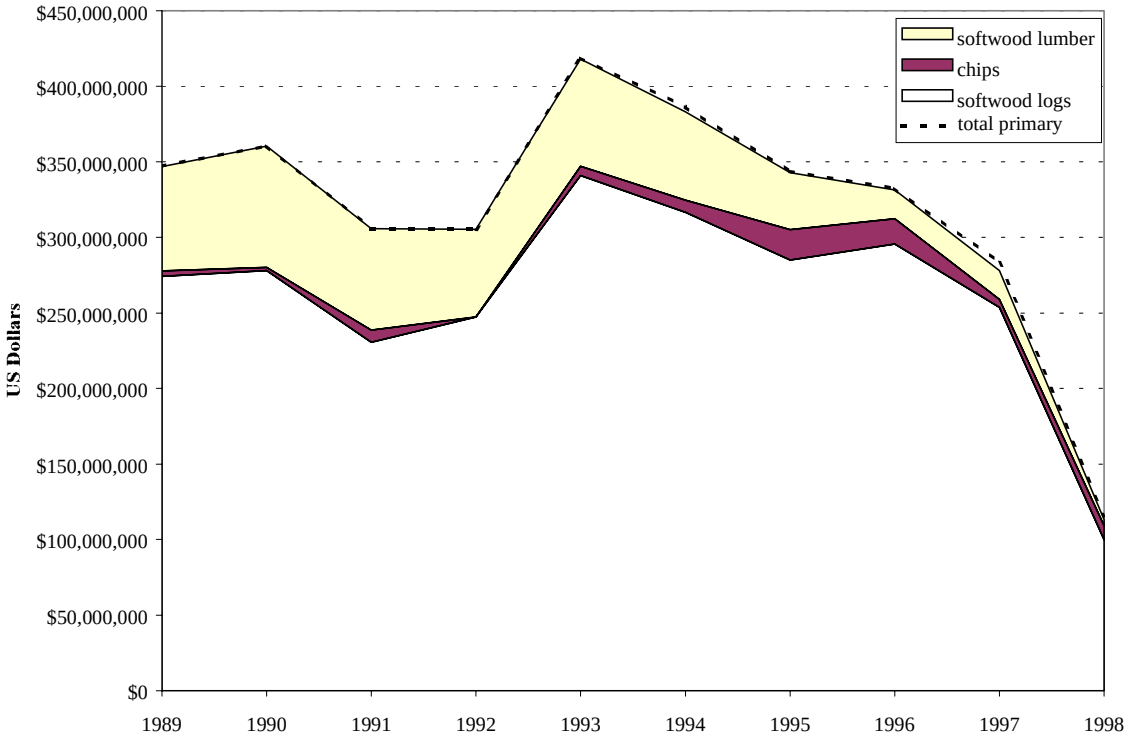

Figure 15. Leading primary processed wood product exports from Alaska to Japan, 1989-1998
(Source: U.S. Department of Commerce 1999).

Figure 16 shows average prices for comparative quality and diameter softwood logs in Japan, China and Korea. The log grades indicated represent standard log grades specified by the country destination, followed by the log diameter in inches. Pricing data indicate that hemlock logs 12" or more in diameter exported to Japan are consistently higher priced than logs of the same diameter, but of lower quality than logs exported to the Chinese market. While hemlock logs exported to Korea are 8" in diameter compared to the 12" diameter logs exported to China, they consistently command a similar price. Log sorts for each country are uniquely tailored to the specifications of that country.

US export statistics show that there are clear differences in export revenues by species. Figure 17 shows that Sitka spruce has maintained a relatively consistent price premium over other Alaska species. Sitka spruce is also the leading log species exported from Alaska to Japan (Figure 18). Over the past seven years, Alaska mills have exported approximately 200 million board feet of Sitka spruce to Japan annually, an average of 55% of total log export volume. The popularity of Sitka spruce may stem from the fact that it is commonly used in Japanese post and beam homes as a substitute for sugi, a domestically grown Japanese species. Hemlock is the lowest priced species, largely because it competes directly with hemlock supplied by lower cost producers in BC and the PNW and has been displaced by European and New Zealand pine in many markets.

A yen-based price index for major North American log species in Japan indicates price movement by species. Sitka spruce prices stabilized after 1993 and demonstrated an upward trend, indicating that spruce occupied a high quality niche relative to hemlock until mid 1997 (Figure 19). Sitka spruce prices also displayed more stability than hemlock or Douglas-fir prices. Western hemlock and Douglas-fir are imported in larger volumes than Sitka spruce and are therefore more susceptible to substitution by other species, especially within lower grade categories (Robertson and Brooks *unpublished report*). Alaska hemlock value has declined steadily since 1989. Western red cedar export volumes are low but appear to be filling a niche as prices rise.

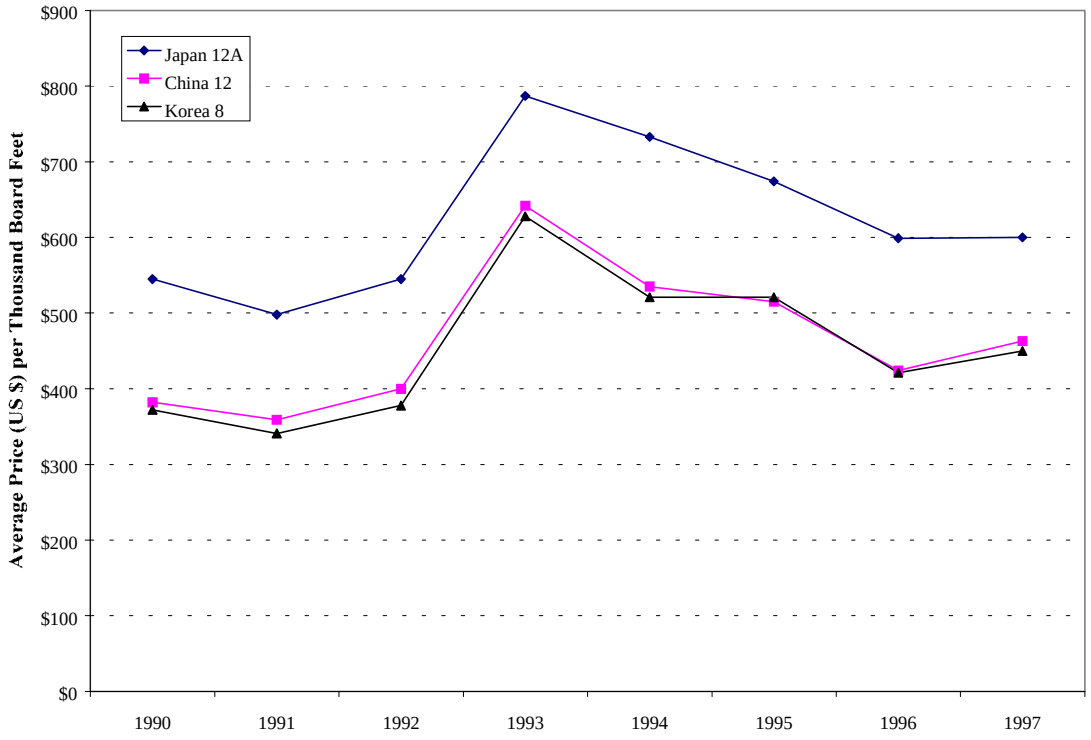

Figure 16. Average price for hemlock export logs by grade (Source: Log Lines 1999).

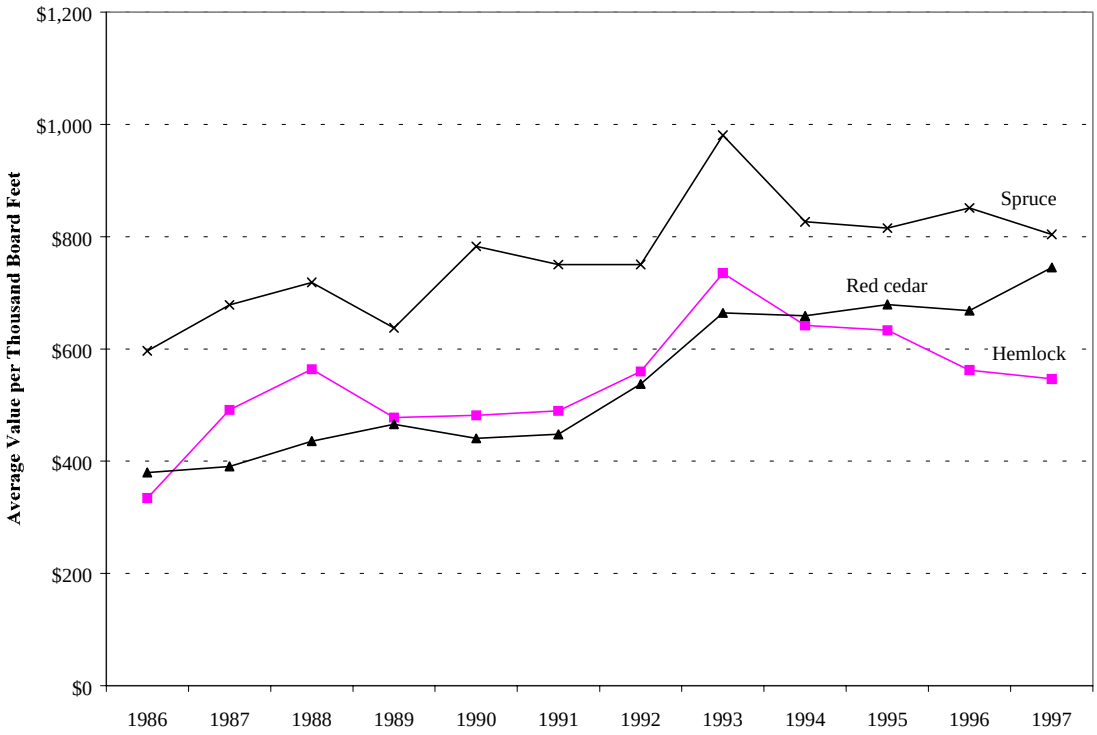

Figure 17. Average value for Alaska log exports to all destinations by species (Source: Warren 1998).

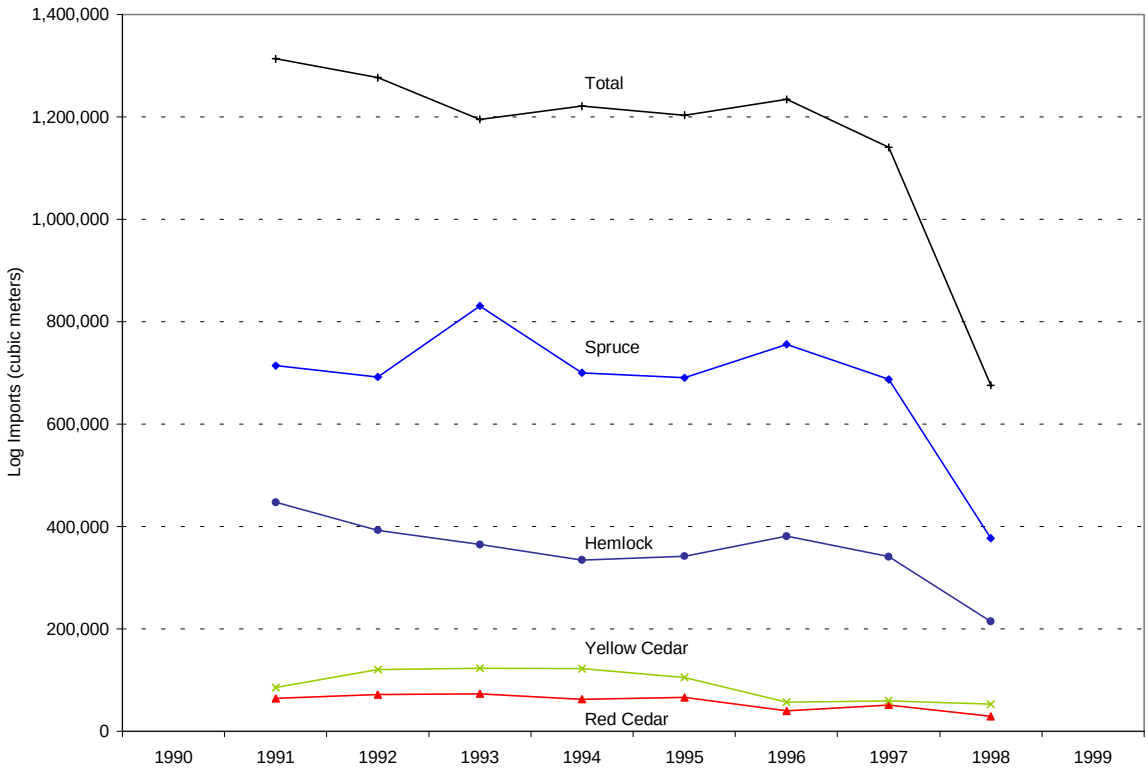

Figure 18. Alaska softwood log export volume to Japan by species, 1991-1998
(Source: JLIA 1999). 1 cubic meter equals 423 board feet

The impact of the harvest constraints on Alaska's competitiveness in Japan is evident when looking at Japan's softwood log imports by source (Figure 19). Alaska has a significantly smaller share of the Japanese imported softwood log market than Russian, US, or radiata pine suppliers. However, Alaska has maintained a much more consistent share of the Japanese market than suppliers in the continental US, who have lost market share to lower cost Russian, European, and radiata suppliers since harvest levels were reduced (Figures 20 and 21). PNW hemlock sold at high prices during the early period of harvest reductions in the PNW, but has since trended downward with Alaska hemlock. Douglas fir's structural characteristics, which are highly valued in Japan, have resulted in prices almost as high as spruce. The sitka spruce/fir premium over other species remains at high levels even after the general decline in Asian market prices.

The volume of hemlock and Sitka spruce products has not only declined substantially over the past ten years but it has change in terms of the product mix (Table 7). The majority of spruce and hemlock products exported to Japan in 1998 were waney cants whereas in 1991 there was a substantial volume of squares and baby squares being exported. The decline in volume and the shift to waney cants is further evidence that Alaska sawmills have shifted to a strategy of minimum processing.

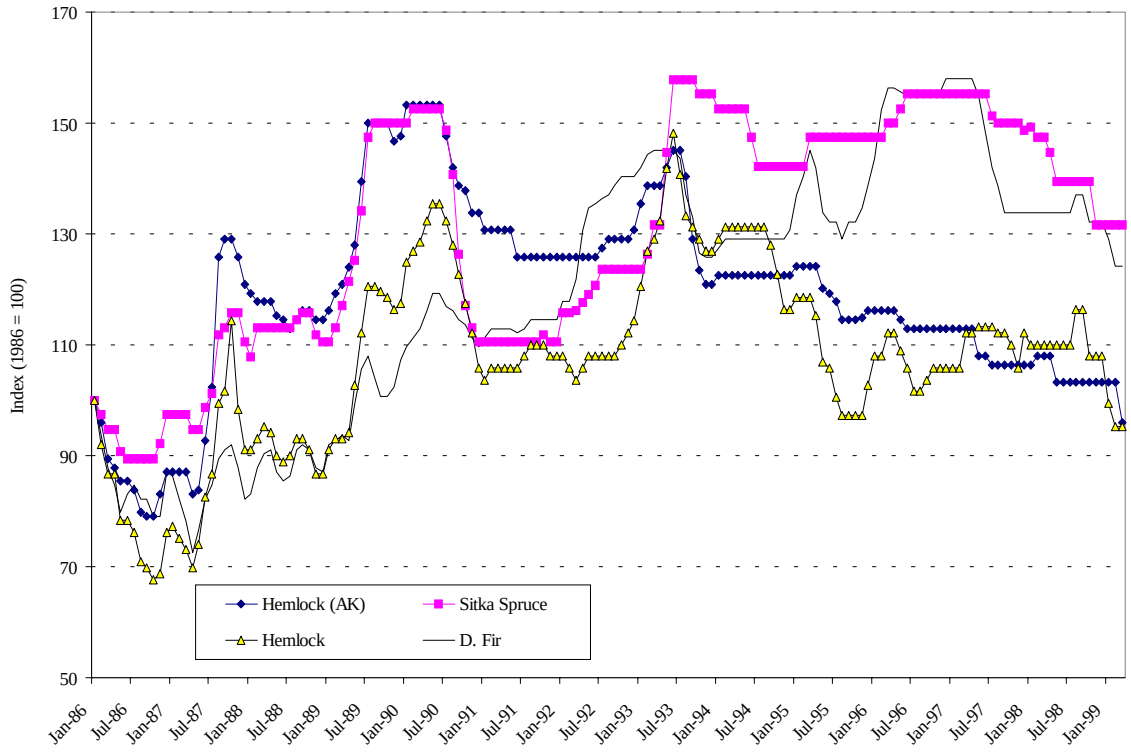

Figure 19. Japanese wholesale log prices (Yen Price Index, Jan 1998 = 100)
(Source: Japan Lumber Journal 2000b).

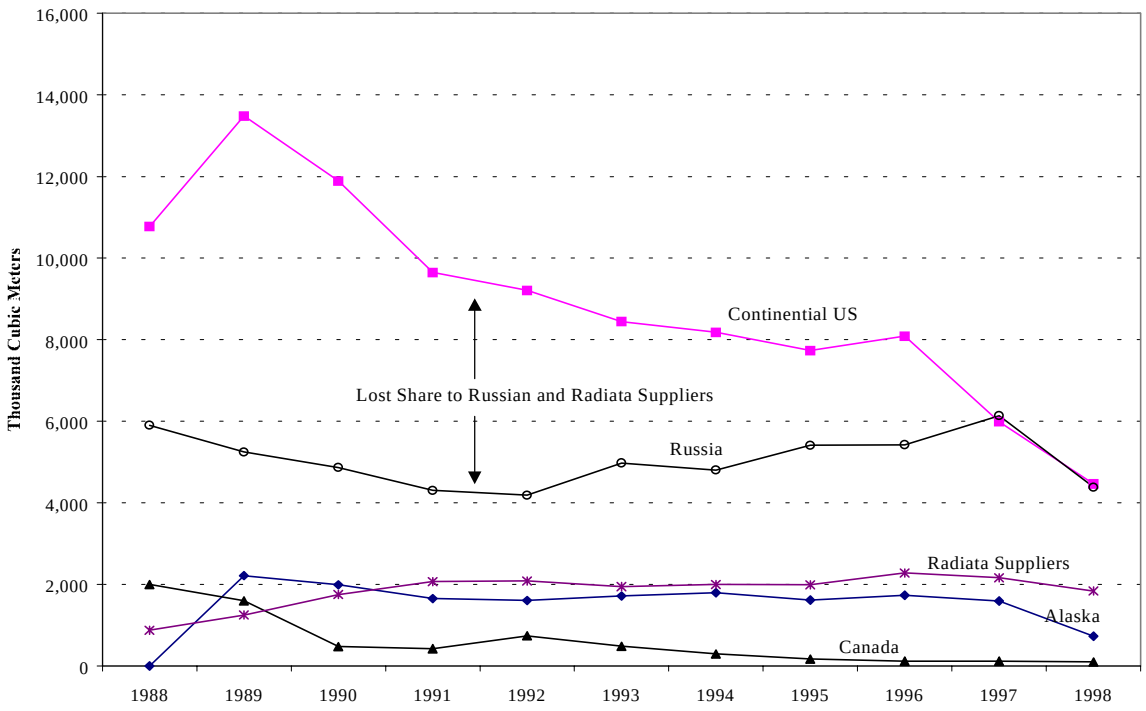

Figure 20. Japanese softwood log imports by source, 1986-1997
(Source: U.S. Department of Commerce 1999, JAWIC 1999).. 1 cubic meter equals 423 board feet

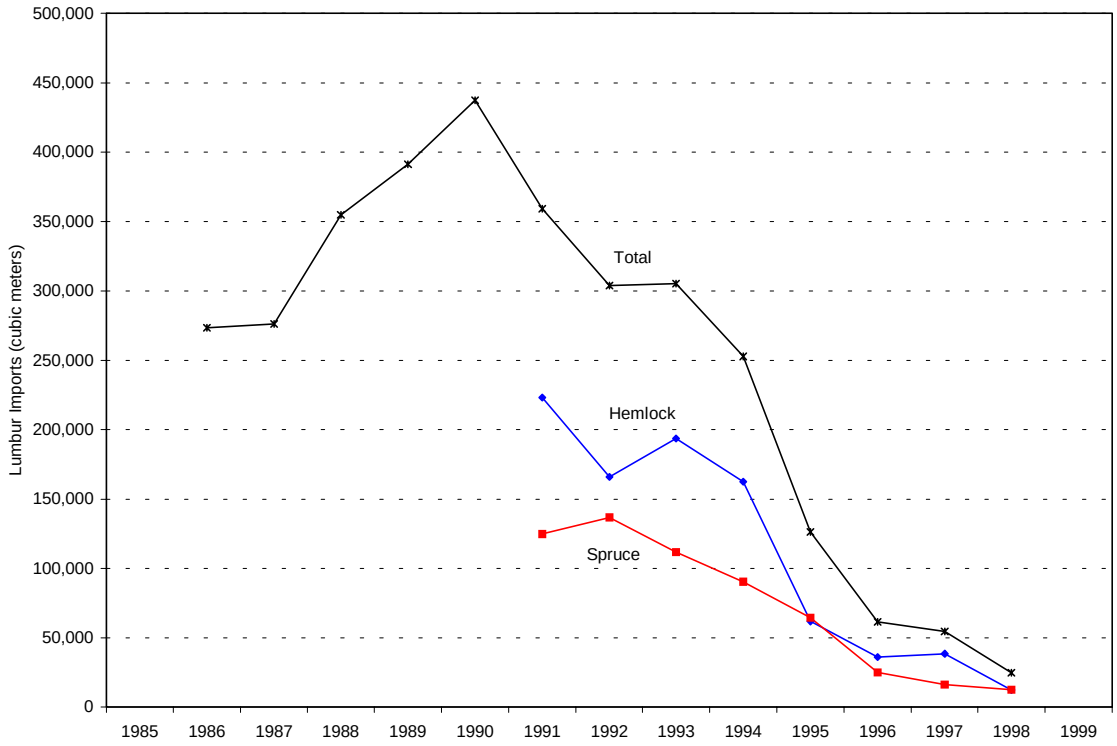

Figure 21. Japanese imports of Alaska softwood lumber by species, 1985-1999.
1 cubic meter equals 423 board feet

Table 7. Japanese imports of Alaska wood products, by product type, 1991-1998 (cubic meters).

	1991	1992	1993	1994	1995	1996	1997	1998
Hemlock								
Squares	13,406	2,737	29,745	20,557	2,602	--	--	--
Waney Cants	61,774	65,115	62,772	59,562	40,285	17,074	9,217	4,139
Cants for Resaw	--	2,431	7,863	2,595	--	989	290	533
Baby Squares	46,960	32,217	26,630	42,938	12,102	9,171	13,671	1,740
Dimension Lumber	--	--	--	--	--	--	--	--
Various	100,961	63,298	66,501	36,599	6,818	8,979	15,179	5,886
SubTotal	**223,101**	**165,798**	**193,511**	**162,251**	**61,807**	**36,213**	**38,357**	**12,298**
Sitka Spruce								
Squares	18,188	1,781	20,838	18,768	3,142	--	--	--
Waney Cants	48,123	56,605	47,589	49,218	53,589	16,733	11,770	12,501
Cants for Resaw	--	253	954	578	--	2,492	--	--
Baby Squares	10,638	11,197	9,691	7,893	2,378	2,633	2,450	--
Dimension Lumber	--	240	--	--	--	--	--	--
Various	47,231	66,561	32,584	13,999	5,273	3,144	2,069	--
SubTotal	**124,180**	**136,637**	**111,656**	**90,456**	**64,382**	**25,002**	**16,289**	**12,501**
Total	**359,234**	**303,706**	**305,272**	**252,707**	**126,315**	**61,503**	**54,646**	**24,799**

1 cubic meter equals 423 board feet

Current Uses and Opportunities for Alaska Softwood Species

In 1999, well over 95% of Alaska wood product exports to Japan were comprised of hemlock, Sitka spruce, western red cedar and Alaska yellow cedar, the vast majority of which were exported in log and cant form. To provide a better understanding of how these species are used in Japan, each species will be discussed separately.

Hemlock

The majority of hemlock logs produced in Alaska are imported by Japanese trading companies who often import their logs directly from Alaska on log ships. Most hemlock logs are shipped to the Japanese ports of Tokyo, Nagoya, and Osaka. Once the logs arrive in Japan, the trading companies generally sell them to sawmills (approximately 30%) and wholesalers (approximately 70%). The wholesalers re-sort the logs, based on proprietary grades and the end-use requirement of their customers, before selling them.

Hemlock is traditionally used for structural building components, including posts (*hashira*), sills (*dodai*), and other less critical structural components, such as intermediate posts (*mabashira*) rafters (*taruki*), cross bracing (*sujikai*), and purlins (*moya*) (Tables 8 and 9). Competing species are Douglas-fir, Japanese cedar (sugi) especially in Hokkaido, laminated whitewoods from Europe and Russia, laminated radiata pine, Russian white spruce, and in high quality applications, Japanese cypress (hinoki) and Alaska yellow cedar. The largest single use for hemlock is as posts (*hashira*) used in post and beam construction. Three species, hemlock, Japanese cedar (sugi) and 5-ply laminated whitewood from Northern Europe have captured 90% of the post market. Japanese cedar (sugi) represents 30 to 40% of the post market, and hemlock is losing substantial market share to the European glulam beams. Loss of market share can also be seen in smaller semi-structural components, such a non-structural studs (*mabashira*), as European whitewoods, often laminated or finger-jointed, gain popularity.

European suppliers to the post and beam market in Japan have been successful in offering quarterly pricing and have kept their prices stable. Ninety percent of the European material enters Japan as lamstock while 10% or less enters as finished product. The European lamstock lumber is a very high quality kiln-dried product that is cut to Japanese specifications. Perhaps more importantly, Japanese importers indicate that another reason for the European success can be attributed to European producers responsiveness to Japanese customer requests and their willingness to provide products that meet their customers exact specifications. European five-ply glulam posts produced in Russia by Sumitomo Ringyo are also being imported to Japan.

Hemlock is also used in non-structural applications, including moulding, millwork and shelf material. Competing species include whitewoods from various regions, primarily Europe, spruce, and radiata pine among others. About 10% of the hemlock used is high-grade clear material for use in exposed Japanese house components (*yakumono*) such as *shikii* and *kamoi* (the upper and lower tracks for shoji screens), or in sliding panels (*tategu*) such as shoji. The primary competing species for these end-uses include Sitka spruce and Japanese cypress (hinoki). Similarly, clear hemlock is used in *zosakuzai*, the trim and casing used to imitate western-style interiors.

About 50% of all hemlock imported into Japan is low-grade material that is used for packaging material and competes with radiata pine and Japanese cedar. About 40% of all hemlock imports are used to produce posts and sills for post and beam construction. Finally, approximately ten percent of all hemlock imports are high quality old growth material that is used in non-structural appearance applications where it competes with Sitka spruce and Japanese cypress.

It is difficult to kiln dry hemlock and kiln drying often results in as much as 50% degrade. As a result, hemlock has traditionally not been kiln-dried with the exception of some structural and semi-structural end-use applications. In Japan, the recent adoption of the Housing Quality Assurance Law discussed earlier means that many builders are moving away from the use of green lumber in favor of kiln-dried lumber. This issue has caused significant market share to move from hemlock towards the kiln-dried laminated whitewood lumber from Europe. It should be noted that ease of preservative treatment is one of the reasons hemlock has traditionally enjoyed wide acceptance in the treated sill market. However, because hemlock is treated and installed in the green condition, it is widely viewed as being dimensionally unstable since it shrinks substantially as it dries. As a result, new technology such as the ability to laminate treated lamstock is causing the market to move to laminated Japanese cedar (sugi), radiata pine, and even yellow cedar.

Sitka Spruce

The majority of Sitka spruce logs used for structural applications are imported into Hokkaido while the higher quality logs that are used within the *tategu* (sliding panels) market are imported through Nagoya, Osaka, Shikoku, Hamamatsu, and Tokyo. Sitka spruce is used for structural components including posts and beams, primarily on the northern island of Hokkaido (Tables 8 and 9). The Hokkaido post and beam structural system uses 120mm square posts. The Sitka spruce logs that are sold into the Hokkaido market are generally a lower grade than the Sitka spruce used in other parts of Japan, and knots are much more acceptable in this market. As a result, customers in Hokkaido are much more price sensitive than customers in other regions of Japan and customers who are using Sitka spruce for higher valued end-use applications. It is possible that white spruce from interior Alaska might be acceptable in the Hokkaido market, assuming that its physical and mechanical properties are similar to those of Sitka spruce.

The Sitka spruce market in Hokkaido prefers 12-foot logs, which Alaska suppliers have been reluctant to provide. This may be one reason why the Hokkaido market is turning away from Sitka spruce in favor of Russian spruce (especially from Sakhalin Island), which can be purchased in standard 12 foot lengths. Standard lengths (9 feet for posts) of laminated European whitewood have also succeeded in taking market share away from Sitka spruce. It should also be noted that Hokkaido was the first area in Japan to import whitewoods from Northern Europe and it is estimated that Sitka spruce now holds only 15% of the Hokkaido post market.

Spruce is also used throughout Japan, especially in urban areas, in clear grades for exposed house components (*yakumono*), such as *shikii* and *kamoi*, or in sliding panels such as shoji and fusuma and as trim and casing (*zosakuzai*). Several examples of interior use of Sitka spruce are presented in Photos 1-18. It is also used in musical instruments. It competes with hemlock, white spruce, Russian spruce, Chinese cedar, Japanese cypress (Hinoki), and Alaska yellow cedar. Several manufacturers indicated that while old growth Sitka spruce from both BC and Alaska is acceptable in appearance grade applications, Alaska Sitka spruce is preferred because there is a perceived tendency for the Canadian spruce to darken with exposure over time.

Several shoji manufacturers in Kanuma indicated that they have largely shifted from using Sitka spruce from Alaska to using white spruce from British Columbia. The primary reason for this shift is their perception that the quality of the Alaska Sitka spruce logs was declining as price was rising. In addition to white spruce, the shoji manufacturers interviewed continue to use small amounts of Sitka spruce and yellow cedar. With regard to size, they indicated that they prefer cants in 14 foot lengths. With regard to other clear sawn material, they require dimensions that will yield 36mm thick unfinished stock that will be subsequently remanufactured to a 30mm thickness. While some other standards are used in Japan (for example in the Tohoku region in northern Japan), most shoji are manufactured to the 30mm thickness standard. It should be noted that with the decline in the popularity of Japanese style tatami rooms, the tategu market is shrinking. In the past, it was this market that drove the demand for high quality Sitka spruce logs in Japan.

Several manufacturers suggested that there might be an opportunity for Sitka spruce dimension lumber in non-structural appearance applications. Given that dimension lumber is approximately 38 mm thick, this product would meet the thickness requirements established for the tategu market, assuming that it also met the quality requirements of the market. These manufacturers also felt that Sitka spruce lumber used within the tategu market could be purchased green or air dried because of its greater dimensional stability.

Alaska (Yellow) Cedar

Yellow cedar's natural decay resistance makes it a popular material for sills (dodai) in both post and beam and 2x4 construction (Tables 8 and 9). Six foot sorts and lower grade material go to sills or laminated sills. The most common yellow cedar sill material is solid-sawn, and undried and generally milled into 105mm x 105, and 120mm x 120mm squares. Competition in the sill market comes from treated hemlock, treated Japanese cedar (sugi), and increasingly from laminated radiata pine (LVL) and laminated whitewoods. In spite of the competition, yellow cedar has been gaining market share in the sill market and this has been partly attributed to its natural decay resistance, which makes the use of toxic preservatives unneccesary.

Twelve-foot and longer high-quality log sorts are used for specialty construction such as marina construction and marine pilings, temple and shrine construction, and renovation work on temples and shrines. In these cases it often competes with Japanese and Taiwanese cypress (hinoki), the traditional favorite for temple construction. Canadian

yellow cedar is often preferred over Alaska yellow cedar. Canadian logs have a larger diameter, tighter growth rings and there is a perception that Alaska yellow cedar has more decay around knots than yellow cedar from British Columbia.

Non-structural uses include tategu, keshozai, yakumono, flooring, and bath tubs. The majority of yellow cedar logs are imported into Nagoya, although it is also imported into the ports of Tokyo, Matsayama, Wakayama, and Shikoku.

Western Red Cedar

Western red cedar is traditionally used in decorative applications (keshozai) notably in ceiling panels as well as in sliding doors (tategu) (Table 9). It is not, however, the preferred species except perhaps in ceilings panels. The low cost of whitewoods from Europe, Russia and Canada make the future of red cedar seem bleak for these applications.

The influences of North American culture, however, have caused a boom in "outdoor life", as seen in sales of sports utility vehicles and outdoor garments and gear. There is a growing desire for backyard decks, lawn furniture, and planters, and only the lack of space will limit the scale of this trend.

Value added products such as outdoor furniture and planters may see increased sales in the future, as may building materials for decks. Finished or knock down products might be distributed through specialty stores such as flower and garden outlets, department stores, and do-it-yourself (DIY) outlets. As for decks, some consumers may ask a builder to assist with the project, and that builder will probably go to a lumber supplier for the materials. Other consumers will choose to do the work themselves, and might prefer to purchase kits or materials that are easy to handle and use. In such cases, a DIY outlet is the logical choice.

One interesting product that we saw was an interlocking wood paver system meant to be laid over a concrete veranda (Photos 19-20). The panels were about 12 inches square with a plastic interlocking back. Spaces in the wood and plastic allows water to pass through and drain away. While this product would see competition from other water resistant species, especially from Southeast Asia, the size of this market (mostly condominium dwellers) is potentially very large if such a product gained popularity.

Table 8. Post and beam construction uses by species.

	Product	Market Share (%)	Share Change '99/'98
Post *(Hashira)*	Laminated	66.2	+5.4
	Cypress	14.0	+3.1
	Cedar	10.6	-7.0
	Hemlock	4.5	+0.3
	Other	4.6	-1.8
Beam *(Hirakaku)*	Douglas-fir	62.6	+3.6
	KD Douglas-fir	(37.9)	+10.5
	Laminated lumber	29.0	+1.6
	(Whitewood)	(12.6)	+4.0
	(DF)	(7.1)	-5.7
	Other	8.5	-5.1
Sill Plate *(Dodai)*	Hemlock	54.5	-17.6
	Yellow cedar	19.5	+8.3
	Cypress	9.3	-2.0
	Laminated	6.0	+5.8
	DF	2.9	-
	Others	7.8	-

Table 9. Description of species and end-uses of wooden structural components in Japanese post and beam construction.

Components for traditional post and beam house				
Component		**Examples**	**Species Used**	**Usage**
Kozozai	Structural components Used in all post and beam construction	Posts (toshibashira and kudabashira), beams (hirakaku), sills (dodai), and purlins (sumiki) Square posts (in mm.): 90 x 90, 105 x 105, 120 x 120, 130 x 130, 150 x 150 Rectangular beams (in mm.):	Hemlock	posts, treated sills
			Douglas Fir	beams, purlins
			Hinoki	posts, beams, purlin
			Japanese Cedar	posts, treated sills
			White Wood, Europe, Laminated	all, treated in sills
			White Wood, Russia, Laminated	all, treated in sills
			Radiata Pine, LVL	all, treated in sills
			Yellow Cedar high grade	posts, beams purlins
			Yellow Cedar low grade	sills, usually untreated
			Sitka Spruce, Hokkaido	all, treated in sills
			Russian White Spruce Hokkaido	all, treated in sills
Hagarazai	Semi-structural components Used in all post and beam construction	Non-structural studs (mabashira), cross-bracing (sujikai), rafters (taruki), floor joists (neda) typical sizes (in mm): 30 x 40 36 x 45 45 x 90 27 x 105	Hemlock	all
			Douglas Fir	all
			Hinoki	all
			Japanese Cedar	laminated mabashira
			White Wood, Europe, Laminated	laminated mabashira
			White Wood, Russia, Laminated	laminated mabashira
			Radiata Pine, LVL	laminated mabashira
			Sitka Spruce, Hokkaido	all
			Russian White Spruce Hokkaido	all
Yakumono	Integral exposed wood parts (clear) Used in Japanese rooms only	Horizontal band & top track (kamoi), bottom track (shiki)	Hemlock	all
			Hinoki	all
			Sitka Spruce	all
			White Spruce	all
			Yellow Cedar	all
			Chinese Ceda	all

Table 9. Description of species and end-uses of wooden structural components in Japanese post and beam construction (continued).

Components for traditional post and beam house				
Component		**Examples**	**Species Used**	**Usage**
Keshozai	Decorative and special components Used in Japanese rooms only. Note: this category includes many exotic and specialty species for special purposes	Decorative posts (tokobashira), tokonoma parts, decorative band (nageshi)	Hemlock	all
			Hinoki	all
			Sitka Spruce	all
			White Spruce	all
			Yellow Cedar	all
			Chinese Ceda	all
			Exotics	as specified
Tategu	Sliding doors, etc. Used in Japanese rooms only	Sliding doors (shoji and fusuma), rain doors (amado)a	Sitka Spruce	all
			White Spruce	all
			Yellow Cedar	all
			Red Spruce	all
			Hinoki	all
Zosakuzai	Trim, casing, base Used in western-style rooms and often finger-jointed and overlaid	trim, casing, base	Hemlock	all
			Sitka Spruce	all
			White Spruce	all
			Yellow Cedar	all
			Red Spruce	all
			Hinoki	all
			Chinese Ceda	all
			Radiata pine	all
			Japanese Cedar	all

Photo 1. Alaska Sitka spruce waney cants stored at the Tokyo City Lumber Terminal.

Photo 2. Alaska Sitka spruce waney cants.

Photo 3. Sitka spruce waney cants at a shoji manufacturer in Japan.

Photo 4. Logs at a small sawmill in Kanuma, Japan that specializes in custom cutting Sitka spruce.

Photo 5. Rough sawn spruce boards are stickered prior to being air dried.

Photo 6. Kiln dried Sitka spruce lumber cut to the 38mm by 135mm dimension favored by shoji manufacturers.

Photo 7. Rough cut Sitka spruce lumber stacked for air drying.

Photo 8. Sitka spruce is the primary species used in this shoji manufacturing company.

Photo 9. Older production machinery means that manufacturers are reluctant to change the mix of species they use.

Photo 10. Example of a shoji door manufactured from Sitka spruce.

Photo 11. Interior view of a Japanese home utilizing shoji components manufactured from Sitka spruce.

Photo 12. Interior view of a Japanese home utilizing shoji components manufactured from Sitka spruce. Note wide ceiling panels.

Photo 13. Interior view of a Japanese home utilizing shoji components manufactured from Sitka spruce.

Photo 14. Interior view of a Japanese home utilizing shoji components manufactured from Sitka spruce.

Photo 15. Interior view of a Japanese home utilizing shoji components manufactured from Sitka spruce.

Photo 16. Interior view of a Japanese home utilizing shoji components manufactured from Sitka spruce.

Photo 17. Interior view of a Japanese home utilizing shoji components manufactured from Sitka spruce.

Photo 18. Interior view of a Japanese home utilizing shoji components manufactured from Sitka spruce.

Photo 19. Top view of a modular outside decking system being sold in Japan. The wooden decking is manufactured from Jarrah, a durable wood species imported from Australia.

Photo 20. Bottom view of a modular decking system showing type of hardware used.

Dimension Lumber

Two-by-four residential construction drives the Japanese demand for dimension softwood lumber. Deregulation in the housing industry and the growing popularity of western-style homes have stimulated demand for 2x4 homes. While still a small segment of Japan's housing industry, the proportion of 2x4 homes has more than doubled in the past eleven years. Despite this growth, the demand for US dimension lumber is struggling. Recent levels of 2x4 housing starts have been slow probably due to the economic recession in Japan and homebuilders reservations about the impact the Housing Quality Assurance Law (HQAL) on the wood-frame construction industry. The future use of green lumber is uncertain since provisions in the HQAL require builders to provide the homeowner with a ten year warranty on a new home. More stable lumber products such as kiln-dried lumber and glue laminated lumber are expected to largely replace green lumber in new home construction. This preference for dry lumber is already evident from the price differences that exist between green lumber and kiln-dried lumber (Figure 22). For example, green hemlock dimension lumber prices are softening and in March 2000 sold for approximately 28,000 yen (US $263) per cubic meter. Comparatively, kiln-dried hemlock and SPF prices were stable at approximately $380 per cubic meter. Unfortunately, a time series of green dimension lumber prices is not available, although the comparative data for March, 2000 suggests that green hemlock dimension lumber sells for a 31% price discount relative to kiln-dried hemlock dimension lumber. Industry reports also indicate that sales of green Douglas fir dimension lumber and hirakaku beams are poor and prices are slipping (Japan Lumber Reports 2000).

Recently introduced certified rationalized post and beam housing may affect sales of dimension lumber and 2x4 homes. Two-by-four technology has been touted as superior to post and beam construction based on its superior structural performance in earthquakes and seismic events. The devastation that occurred during the Kobe earthquake in 1995 was viewed by many as proof of the superior performance of 2x4 construction relative to post and beam construction. However, the devastation occurred in structures that were built prior to 1980. The post and beam industry has countered by developing a certified rationalized post and beam housing system. The Housing and Wood Technology Center (HOWTEC) evaluates rationalized post and beam house systems for structural performance and provides certification for those systems that meet their performance criteria. As shown in Figure 23, the number of certified rationalized homes has increased over 600% since 1990. While there are still fewer annual housing certified rationalized post and beam housing starts than 2x4 starts, continued growth of the certified rationalized post and beam market could cut into sales of 2x4 homes. This could mean greater demand for kiln-dried baby squares and lower demand for dimension lumber. However, it is more likely that growth in certified rationalized post and beam housing starts would compete directly against the traditional post and beam segment of the housing market.

Japan consumes 60% of Alaska's softwood lumber exports, yet Alaska supplies less than 1% of Japan's softwood lumber imports. Over the past twelve years Alaska producers' export volume and share of the Japanese imported softwood lumber market has dropped from almost 6% to less than 1% (Table 11). Overall, Japan's lumber imports have fallen dramatically since the end of 1997 when the country entered a recession. Lumber consumption is showing signs of recovery, yet in the meantime there have been shifts in suppliers and changes in housing laws. These two factors have affected potential trade with Alaska and Japan. While Alaska suppliers have lost market share, lower cost suppliers have made visible gains, most notably, Canada, Russia, New Zealand, and Chile. Imports of high-quality European whitewood have also increased. European supplier willingness to produce kiln-dried lamstock cut to Japanese specifications has helped them improve their position in the Japanese market. The structural stability of laminated lumber is very attractive to Japanese contractors. In addition, the weakness of the Euro and the Canadian dollar have put Alaska producers at a competitive disadvantage in this more price sensitive segment of the Japanese lumber market.

Table 10. Japan's housing starts by type, 1988-1999.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Non-wood houses	1,083,106	746,123	731,460	788,188	848,821	804,206	888,970	775,698	653,162	649,057
Wood houses	624,003	624,003	671,130	697,496	721,431	666,124	754,296	611,316	545,133	565,544
2x4 houses	51,093	45,437	52,933	56,299	64,037	73,989	93,693	79,458	67,923	75,864
2x4 % of wooden houses	8%	7%	8%	8%	9%	11%	12%	13%	12%	13%

Source: Japan Ministry of Construction 2000.

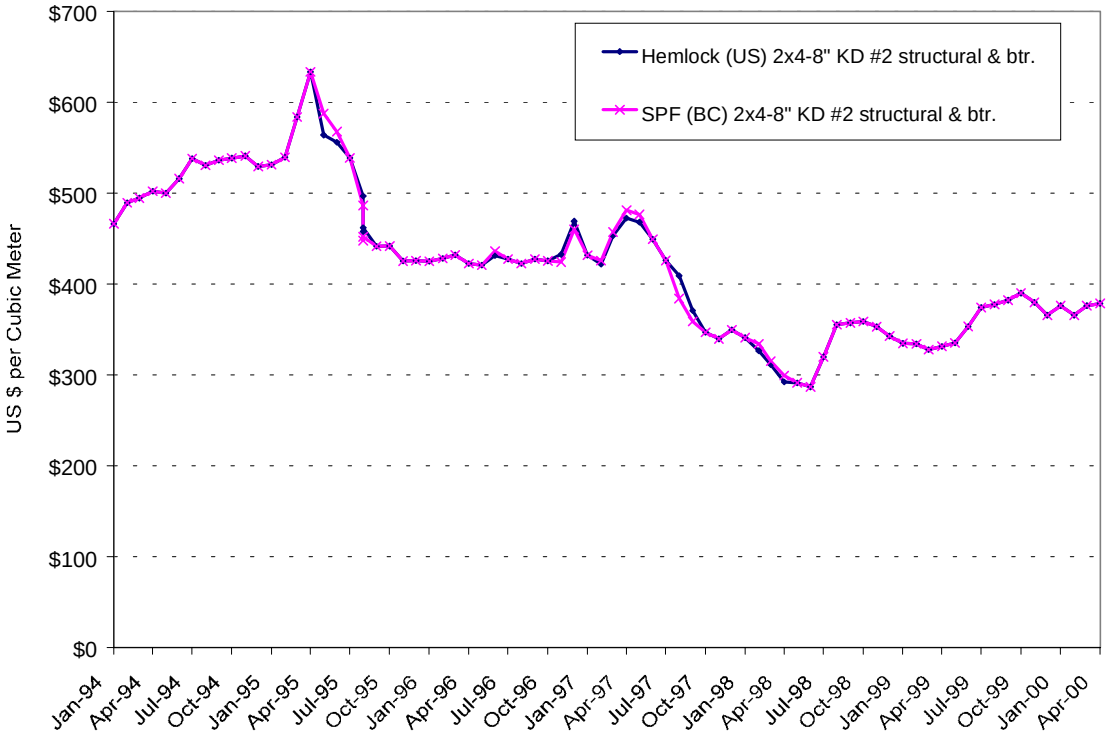

Figure 22. Japan prices for kiln-dried hemlock and SPF dimension lumber (1994-2000). (Source: Japan Lumber Journal 2000). 1 cubic meter equals 423 board feet

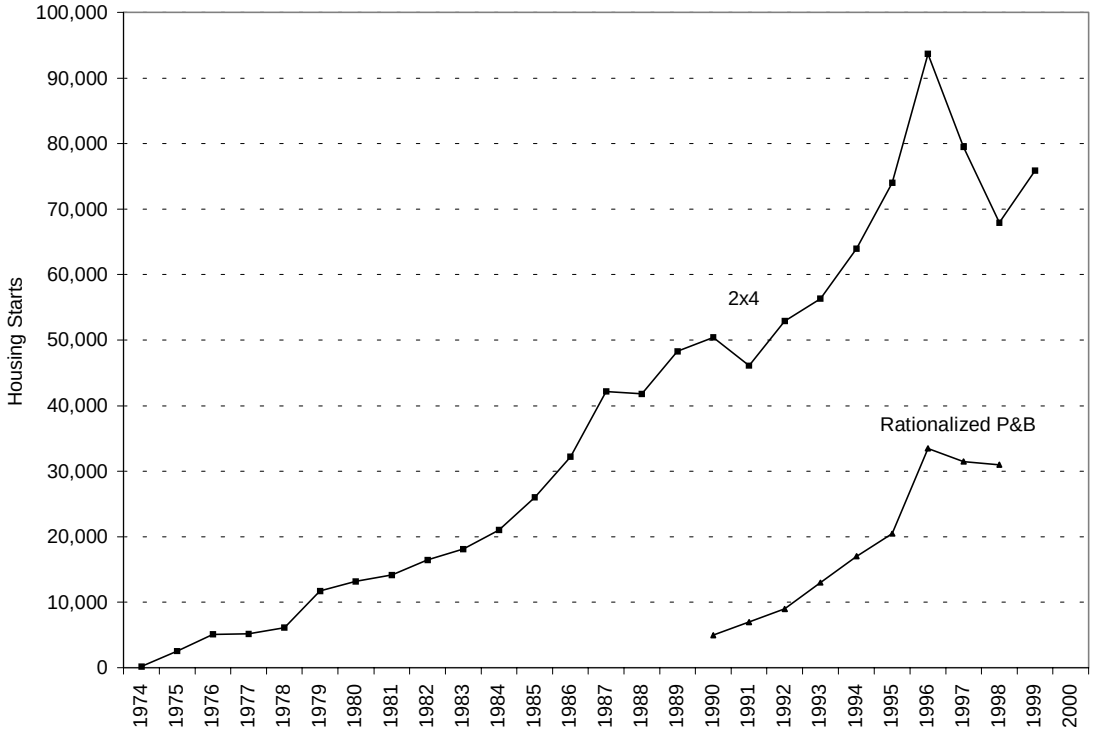

Figure 23. Annual housing starts using the 2x4 and rationalized post and beam systems (Source: HOWTEC 1999).

Alaska's most significant competitor in Japan's lumber market is British Columbia. Even though harvest costs in coastal BC are higher than Alaska and the PNW, government controlled stumpage prices have enabled the Canadian lumber industry to maintain a cost competitive edge over regional competitors. Strong government support for the Canadian lumber industry, including international marketing support, workforce training, and low stumpage prices have helped Canada become a dominant supplier of softwood lumber in the US and Asia. If Alaska suppliers are to increase their share of Japan's dimension lumber market they must be able to supply kiln-dried lumber at cost competitive prices. This means improving the capacity and efficiency of local mills to include dry kilns. It also means being identifying a cost competitive method for shipping kiln-dried lumber.

However, changes to BC mills' production capabilities should make it increasingly difficult for Alaska mills to compete. In light of the HQA law, many BC lumber mills are expanding their kiln-drying capacity to supply the projected increase in demand. The volume of Canadian kiln-dried hemlock and Douglas fir lumber is expected to increase as BC coastal mills try to recover their lost share of the post market (Japan Lumber Reports 2000a) In addition, the US-Canada Softwood Lumber Agreement has restricted the volume of SPF dimension lumber that BC interior mills can export into the US. As a result, the volume of kiln-dried SPF dimension lumber exported from interior BC sawmills to Japan has increased substantially. However, the Japanese have expressed some concerns regarding the fact that SPF dimension lumber is not segregated by species prior to being kiln-dried. Thus, kiln-dried dimension lumber from Alaska that consists of a single species, rather than a species mix, might gain greater acceptance with Japanese homebuilders.

Another opportunity for Alaska producers may be to supply kiln-dried baby-square posts or lamstock for the post and beam construction industry. This market will still have strong competition from the Europeans (lamstock) and Canadians (hirakaku beams) but the size of the market warrants further investigation. While Japanese mills have historically had minimal kiln-drying capacity, the passage of the HQAL means that many Japanese mills have started to increase their kiln drying capacity. According to a recent survey conducted by the Japan Lumber Reports, the kiln-drying capacity of the Japanese sawmill industry just 15-20% of total lumber output (Japan Lumber Reports 2000a). However, the kiln drying capacity is expected to increase substantially in the next few years as the demand for kiln-dried lumber increases.

Table 11. Japan's softwood lumber import volume by source (1,000 cubic meters).

Supplier	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Canada	4,000	4,000	4,500	5,400	5,200	5,350	5,700	6,000	5,700	3,950	4,717
Continental US	3,400	2,800	2,600	2,400	2,500	2,300	2,050	2,000	1,550	689	659
Europe	50	0	0	0	200	500	800	1,100	2,050	1,097	1,901
Radiata	230	350	350	300	350	300	450	400	700	654	709
Russia	175	150	150	150	170	200	250	250	300	307	459
Alaska	391	437	359	304	305	253	126	62	55	25	33
Total	**7,855**	**7,300**	**7,600**	**8,250**	**8,420**	**8,650**	**9,250**	**9,750**	**10,300**	**6,697**	**8,478**
Alaska share	5.0%	6.0%	4.7%	3.7%	3.6%	2.9%	1.3%	0.6%	0.5%	0.4%	0.4%

Source*:* U.S. Department of Commerce 1999, JAWIC 1999.
(1 cubic meter = 423 board feet)

Japanese Market for Imported Timber Frame and Log Cabin Kits

Overview of Japanese Policies to Promote the Import of Wooden Housing

Import housing has been defined by the Imported Housing Industry Council as "housing of basic foreign design concepts that utilize foreign materials in about more than half the materials used" (JETRO 1996a). It excludes housing that imitates foreign design or housing that uses only small quantities of foreign components and materials such as Japanese-style 2x4 houses (using the 3x6 module). Imported houses have been sold in Japan since 1909 when an American businessman first sold a prefabricated 2x4 house in Tokyo (JETRO 1996c). However, it was not until recently when the government and related parties have been focusing on increasing imported housing.

The Japanese government has been actively trying to increase housing imports. The Ministry of International Trade and Industry (MITI) announced plans to import 50,000 houses over a five to seven-year period starting in 1993 (Nakamae 1993). MITI also reduced the 4% tariff to 3% on imported housing kits. Furthermore, the Export-Import Bank of Japan increased the amount of low-interest loans available to companies importing houses. As a result, the Imported Housing Industry Council expects imported houses to reach 30,000 per year.

The Japanese government has implemented many programs to increase production of lower cost, high quality housing including imported 2x4 housing. The Ministry of International Trade and Industry (MITI), the Ministry of Construction (MOC), and the Government Housing Loan Corporation (GHLC) are among those agencies that have started promoting 2x4 homes. The MOC has proposed a plan to reduce housing costs to roughly five times the average annual salary for Japanese salaried workers (Yamakoshi 1994). This would be equivalent to reducing housing costs by 33%. They want to achieve this goal by fiscal year 2000. This was introduced by past Prime Minister Miyazawa in the "Five-Year Economic Plan: Sharing Better Quality of Life." This plan aim is to provide quality housing suitable for Japan's economic consumer power. They also want to import more low cost building materials (Pacific Rim Wood Market Report 1996). These goals were reinforced in the governments Action Plan announced in 1994. The Hashimoto administration implemented widespread deregulation by revising the Ministry of Construction's (MOC) 2x4 standards on March 30, 1997. Building standards are now less restrictive in order to reduce housing costs (Washington State CTED 1997). Some of the issues being studied included: reducing the time of issuing work visas for US carpenters entering Japan, providing wider acceptance of US lumber grade marks, and moving towards performance based building codes.

Reducing the time of issuing work visas will enable US workers to more easily enter Japan to build houses and educate Japanese construction workers on North American-style 2x4 construction techniques. Wider acceptance of US lumber grades will reduce the non-tariff barriers imposed on US lumber. A performance based Construction Standard Law allows various designs and building products to be used (Japan Lumber Journal 1997c). The Ministry of Construction anticipates that new products will be developed, new technologies will be used, and foreign products will be introduced into the marketplace. These will reduce the construction time of large wooden buildings, which are currently hampered by cumbersome regulations. The current Building Standard Law is considered cumbersome mostly because of the non-performance based specifications of engineering methods, materials, and sizes. Hopefully this has been addressed with the recent revisions to the Standard Law.

The MOC made many revisions to the Buildings Standards Law in order to allow easier market access for import housing companies. In 1987, MOC first allowed the construction of a 3-story wooden house, which met certain technical standards within the quasi-fire prevention area. Then in 1992, the MOC allowed 3-story wooden apartments outside of the fire prevention area and the quasi-fire prevention area (Japan Lumber Journal 1995). In 1993, the Building Standards Law was modified again by increasing the maximum allowable floor space for wooden houses from 21,500 ft^2 to 32,300 ft^2. These changes encouraged the building of three-story, multi-family wooden houses. These apartments are very attractive for Japan's aging population because the elder parents can live with their children in a less expensive and more convenient manner. It is estimated that the percentage of people over age 65 will increase from 14.5% in 1995 to 20% in 2010 (Kodansha International 1995). This is higher than the estimated percentage in the US and Germany of 16% and 18% respectively (Jahraus and Cohen 1997).

The MOC also allowed all North American wood products used in 2x4 construction, including lumber and plywood, to enter the Japanese market as they are without being graded to JAS standards on January 9, 1997 (Japan Lumber Journal 1997a). Both the American Lumber Standards Committee and Canadian Standards Accreditation Board

lumber grades are recognized. These include grading agencies such as APA, WWPA, and NLGA. This reduces the cost of lumber and increases the speed of delivery.

The Government Housing and Loan Corporation has also increased the income ceiling for their programs to ¥13.225 million (JETRO, 1993). This allows a larger proportion of the population to qualify for inexpensive government mortgages. In addition, financing has been expanded so that houses up to 240 m^2 floor space can obtain financing. These changes have increased the percentage of people who can afford housing. MITI officially promotes imported housing directly through its Housing Industry Division and indirectly through the Japanese External Trade Organization (JETRO). JETRO is an international organization promoting trade with Japan's partners. They have a large budget to support information gathering and construction of model home parks. These activities promote imported wood housing as a high quality, less expensive type of housing.

Imported Wooden Housing in Japan

The market for imported wood products in Japan has been slow to recover from the 1997 Asian economic crisis and the subsequent recession in Japan. One exception to this has been the imported wooden home segment of the housing market, Table 12. Whereas Japanese imports of primary and secondary wood products have declined by 51.9% and 43.5% since 1996, respectively, imports of wooden homes increased by 17.9% over the period 1996-1999. In fact, the 9,638 homes imported into Japan represent a record, easily eclipsing the previous record of 8,173 established in 1996. Further, the import statistics suggest that this segment of the market has been much more resilient during the economic recession in Japan than has any other segment of the housing market.

The categories of imported wooden housing consist of log homes, 2x4 homes, panelized homes, post & beam homes (timber frame), as well as other types (such as steel frame homes and various proprietary construction systems). Industry statistics show that in 1999 the majority of wooden homes imported into Japan were 2x4 homes (67.7%), followed by log homes (8.1%), panelized homes (5.5%), and post and beam homes (1.9%). While imports of wooden homes into Japan reached a record high in 1999, the structure of the product mix has changed substantially since 1996. Log homes displayed the greatest growth with the number of units being imported increasing by 178% since 1996. More modest increases were also observed for post and beam homes (64.9%) and 2x4 homes (46.4%). In contrast, imports of panelized homes have declined by 74% since 1996.

Almost three-quarters of the wooden homes imported into Japan were sourced from the US, Sweden, and Canada (Table 13). The US, with a 42.8% market share in 1998, is the dominant supplier of wooden homes into Japan. Sweden, with a 15.5% market share, and Canada, with a 14% market share, are also import suppliers (Photos 21-23). Unfortunately, the Japanese imported housing statistics do not provide details of the types of wooden homes that were supplied by specific countries.

The market for log homes in Japan has traditionally been dominated by domestic firms using local timber species. The primary species used by Japanese log home manufacturers is Japanese cedar (sugi) which is used to build over 80% of the domestically manufactured log homes in Japan. Other domestic species used in log home construction include cypress (hinoki), larch (karamatsu), and in Hokkaido, spruce (ezomatsu) and fir (todomatsu). Log homes imported from the US are usually constructed using lodgepole pine and ponderosa pine, although Douglas-fir is also used. Imported log homes from Scandinavia are almost always built of red pine. Recent import data suggests that the traditional dominance of the Japanese log home industry is being challenged by foreign imports. For example, the most recent data show that the market share of domestic log homes dropped from 73.4% (775 log homes) in 1996 to 59.7% (627 log homes) in 1997.

Photo 21. Finnish log home on display at a model home park just outside of Tokyo.

Photo 22. Interior view of model log home.

Photo 23. Detail of log wall section.

Table 12. Japanese imports of imported wooden homes.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Log	213	174	242	297	472	617	281	424	565	781
2x4	500	582	572	819	1,067	2,509	4,456	5,152	5,199	6,522
Panelized	147	206	436	521	173	1,163	2,030	885	401	527
P&B	111	115	122	111	116	95	97	94	130	160
Other	515	336	340	413	575	1,136	1,309	1,293	1,220	1,648
Total	**1,486**	**1,413**	**1,712**	**2,161**	**3,024**	**5,520**	**8,173**	**7,848**	**7,515**	**9,638**

Source*:* Log House Association of Japan

Table 13. Suppliers of imported wooden homes into Japan, 1998.

	Number of Homes	Market Share (%)
US	3,203	42.8
Sweden	1,164	15.5
Canada	1,050	14.0
Finland	191	2.5
Other	1,906	25.4

Source*:* Log House Association of Japan

The vast majority of log homes are built as either a primary residence or a vacation home (Table 14). In 1997, 30.6% of the log homes built in Japan were primary residences while an additional 43.9% were classified as vacation (or second) homes. The largest numbers of log homes were built in the Nagano (95) and Yamanashi (39) prefectures, located west of Tokyo (Table 15). In addition, a large number of log homes were built on the island of Hokkaido (66) and in Tochigi prefecture north of Tokyo (43). The industry statistics presented in Table 15 show that almost 90% of the log homes built in Japan have a floor area less than 1,600 ft^2. In addition, only about 15% of the log homers built in Japan utilized a GHLC mortgage, in contrast to the 30-35% of total housing that utilized GHLC mortgage funding during the periods 1990-1999. This would tend to indicate that most logs homes are being used as second homes and vacation homes for upper income Japanese.

The widespread use of model homes within the housing industry in general, and in particular the log home industry, is reflected in the number of model log homes built in 1998 (Table 15). The industry statistics show that 198 model log homes were built in 1998, which represents almost twenty percent of the total number of log homes built that year. The log home industry is dominated by a small number of companies. In 1998, just five companies built over 80% of the log homes in Japan, with just two of these companies (Aru Shicoa and Talo International) accounting for almost two-thirds of log home construction.

Table 14. End-use applications for imported and domestic log homes in Japan.

	1996	1997
First House	255	322
Second House	465	461
Retail	33	26
Hotel/Motel	58	27
Sports Facility	10	18
Office	16	12
Meeting Hall	6	1
Other	213	184
Total	1,056	1,051

Source*:* Log House Association of Japan

Table 15. Number of imported and domestic log homes built in each prefecture, by floor area (1998).

Prefecture	Floor Area		Total Log Homes	GHLC Mortgage	Model Homes Established
	Less than 1,600 ft^2	Over 1,600 ft^2			
Hokkaido	61	5	66	3	5
Aomari	5	1	6	0	1
Iwate	2	0	2	0	0
Miyagi	7	0	7	3	2
Akita	2	0	2	0	0
Yamagata	5	1	6	0	0
Fukushima	12	0	12	0	1
Ibaragi	13	3	16	1	4
Tochigi	42	1	43	14	6
Gunma	28	2	30	1	15
Saitama	27	0	27	2	2
Chiba	24	0	24	1	10
Tokyo	11	1	12	1	3
Kanagawa	13	2	15	0	2
Niigata	7	0	7	0	0
Toyama	0	1	1	0	0
Ishikawa	2	0	2	0	1
Fukui	1	1	2	0	0
Yamanashi	37	2	39	3	9
Nagano	82	13	95	13	13
Gifu	18	6	24	1	5
Shizuoka	23	0	23	2	7
Aichi	6	4	10	2	0
Mie	19	2	21	4	3
Shiga	21	14	35	0	0
Kyoto	7	5	12	1	0
Osaka	3	11	14	2	1
Hyogo	10	10	20	2	2
Nara	4	4	8	1	0
Wakayama	6	1	7	1	0
Tottori	2	4	6	0	4
Shimane	2	0	2	0	0
Okayama	12	2	14	1	4
Hiroshima	9	2	11	2	2
Yamaguchi	0	0	0	0	0
Tokashima	1	1	2	0	0
Kagawa	1	0	1	0	0
Ehime	0	0	0	0	1
Kouch	5	0	5	0	1
Fukuoka	4	1	5	1	1
Saga	1	0	1	0	0
Nagasaki	6	0	6	2	0
Kumamoto	5	0	5	0	0
Oita	0	0	0	0	0
Miyazaki	0	0	0	0	0
Kagoshima	2	0	2	0	0
Okinawa*	0	0	0	0	0
Other	380	23	403	98	93
Total	**928**	**123**	**1,051**	**162**	**198**

Source*:* Log House Association of Japan

Table 16. Largest log homebuilders in Japan, 1998.

Company Name	Number of Log Homes Built		Total Number of Log Homes Built Since 1987
	Homes Built	Market Share	
Aru Shicoa	413	39.3%	1,772
Talo International	258	24.5%	1,427
Big Box	83	7.9%	180
Mountain Homes	52	4.9%	355
Mitsui	42	4.0%	593

Source*:* Log House Association of Japan

Strategic Recommendations

Structural Lumber

The Japanese market is experiencing a period of transition due to regulatory changes and new construction technologies. These changes have had, and will continue to have, a dramatic impact on the mix of wooden building materials that are used in residential construction. In addition, these changes are widely expected to change the way that wooden building materials are distributed in Japan as well as the types of support services that Japanese customers will expect. This period of transition will provide opportunities for those suppliers of wooden building materials who are willing and able to meet the changing needs of the Japanese market.

Perhaps the most important aspect of these market changes has been their impact on how houses are built in Japan and the types of building materials that are specified by manufacturers and residential contractors. The Japanese market is transitioning from a green lumber market towards kiln dried lumber. This transition is happening in both the 2x4 market as well as the larger post and beam market with respect to lumber used in structural applications. As the market for green lumber shrinks in Japan, opportunities exist for Alaska manufacturers willing to provide kiln dried lumber to Japan. However, the Japanese have clearly indicated that they prefer softwood lumber to be dried on a species by species basis rather than within species groups (such as SPF lumber). Another consideration is that structural lumber must possess a grade stamp from either a recognized US grading agency (e.g., WWPA, and WCLIB) or the Japanese Agricultural Standards (JAS).

In particular, Alaska producers should be able to take advantage of the preference for Sitka spruce in Hokkaido to supply kiln dried dimension lumber for the 2x4 market and kiln dried baby squares for the post and beam market (90mm, 105mm, 120mm, 130mm, and 150mm squares). In addition, the price sensitivity of end-users in Hokkaido provides an opportunity to utilize lower cost and lower quality small diameter Sitka spruce logs. The increasing price sensitivity of the Japanese is an important factor to take note of since the Japanese have typically been price insensitive in the past.

Two other products that should be of potential interest to Alaska sawmillers are non-structural studs (mabashira) and sill plates (dodai) for post and beam homes. Mabashira are used to fill in between the structural posts and they are typically 30mmx105mm in size. The mabashira market may provide a good opportunity for utilizing white spruce logs harvested from interior Alaska. In the past, Japanese builders tended to use pressure treated green hemlock for dodai, which are generally 105mmx105mm and 120mmx120mm. However, homeowner concern about the environmental and health impacts of wood preservatives have provided an opportunity for decay resistant species to be used for dodai. Alaska (yellow) cedar is readily accepted by Japanese builders for use as dodai and this market has tremendous potential for Alaska producers.

The rapid growth of the precut industry provides an opportunity for Alaska sawmillers to export kiln dried lamstock to precut component manufacturers. Despite the fact that the Europeans currently dominate this market segment, it is still a potentially lucrative market for Alaska lumber producers to explore. However, this market requires not only that the lumber be kiln-dried but that it is planed to meet very demanding thickness and width specifications. The preferred dimensions for lamstock in Japan are 22mm in thickness and 108mm in width. Another factor is that, given the dominance of the Europeans in this market, Japanese lamstock manufacturers tend to prefer lighter colored woods, although this is not an absolute market requirement since many glulam posts are not used in exposed applications.

Non-structural Lumber

Perhaps the greatest market opportunity for Alaska softwood lumber exists in the market for non-structural lumber products. Japanese shoji manufacturers have a long history of utilizing Alaska Sitka spruce, western red cedar, and Alaska (yellow) cedar in the manufacture of a wide variety of products. Clearly there is already a strong market for logs and waney cants in the shoji industry. Japanese shoji manufacturers prefer waney cants over logs and the cants should be free of heart center (FOHC). Finally, the preferred dimensions for cants are 8.5, 6, and 2.5 inches in thickness and 14 feet in length. Random width cants are acceptable.

However, the opportunity exists to supply both green and kiln dried lumber to shoji manufacturers. Based on interviews with shoji manufacturers in the Kanto region, Sitka spruce and yellow cedar lumber can be supplied green while white spruce lumber should be kiln dried because of its tendency to stain. Shoji manufacturers have a preference for quartersawn lumber and, while they prefer clear lumber, they are willing to accept C&Better grade lumber. Lumber used for shoji manufacture should ideally be 38mm thick, 135mm wide and 14 feet long. However, the basic dimensions for shoji lumber are as follows: thickness should be at least 36mm and the width should be between 123mm and 190mm. Several shoji manufacturers noted that they were imported white spruce dimension lumber (2x6, 2x8, and 2x10) which they then remanufactured into more traditional sizes. The shoji manufacturers interviewed also indicated that they had already shifted heavily towards using white spruce in their products. They also indicated that price was an important consideration and that the use of lower priced Chinese ceda was rapidly increasing primarily because of its lower price relative to white spruce and Sitka spruce.